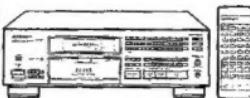


Service Manual



ORDER NO.
ARP2228

COMPACT DISC PLAYER

PD-31

PD-8700
PD-7700

PD-8700-S
PD-7700-S

PD-31, PD-8700, PD-8700-S, PD-7700 AND PD-7700-S HAVE THE FOLLOWING :

Type	Model					Power Requirement	Remarks
	PD-31	PD-8700	PD-8700-S	PD-7700	PD-7700-S		
KU	○	—	—	○	—	AC120V only	
KC	—	—	—	○	—	AC120V only	
HEM	—	○	—	○	—	AC220-230V, AC230-240V(swivable)*	
HB	—	○	—	○	—	AC220-230V, AC230-240V(swivable)*	
SD	—	○	—	○	—	AC110V, 120-127V, 220V, 240V(swivable)	
HEWM	—	—	○	—	○	AC220-230V, AC230-240V(swivable)*	
HPW	—	—	—	○	—	AC220-230V, AC230-240V(swivable)*	

* : Change the primary wiring of the power transformer.

- This manual is applicable to the PD-31/KU, PD-8700/HEM, HB, SD, PD-8700-S/HEWM, PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types.
- As to the PD-8700/HEM, HB, SD AND PD-8700-S/HEWM types, refer to page 81.
- As to the PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types, refer to page 83.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 505 Cochran Drive, Markham, Ontario L3R 8E3 Canada

PIONEER ELECTRONIC [EUROPE] N.V. Kestberglaan 1, 9120 Beveren, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-8911

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FI APR. 1991 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

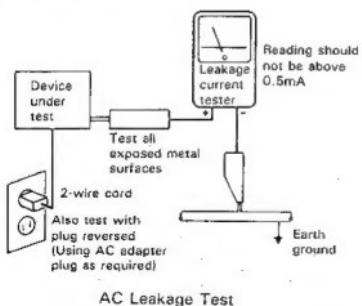
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwsheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!

AVATTAESSA JA SUOJALUKITUS OHITTEAESSA OLET ALTITINA NAKYMATOMALLE LASERSÄTEILYLLÄ. ALÄ KATSO SÄTEESEEN.



LASER
Kuva 1
Lasersäteilyn varoitusmerkki

WARNING!

DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.



LASER
Picture 1
Warning sign for laser radiation

ADVERSEL:

USYNLIG LASERSTRÅLING VED ABNING NÄR SIKKERHEDSAFTRYDRE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

IMPORTANT

THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

VARNING!

OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mW
WAVELENGTH: 780-785 nm

LABEL CHECK

HB,HEM and HEWM types

**CLASS 1
LASER PRODUCT**

PRW102



HEM and HEWM types

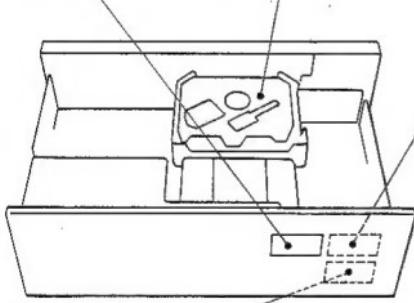
VARO!

AVATTAESSA JE SÄTEESENÄÄN ONTSETTU-
VANA EIET SITITÄIN LASERSÄTEILYLLÄ.
LASERSÄTEILYLLÄ. ALÄ KATSO SÄTEESEEN.

VARNING!

Öppnas sätet strålen när denna del
är öppnad och spärren är urkopplad.
Betrakta ej strålen.

PRW102



ADVARSEL

USYNLIG LASERSTRÅLING VED ABNING NÄR SIKKERHEDSAF-
TRYDRE ER UDE AF FUNKTION.
UNDGÅ UDSAETTELSE FOR STRÅLING.

WAARSCHUWING

ONZICHTBARE LASER-STRAHLING WINT AUS. WENN DEKKEL
ALKMIER KLAPPE GEÖFFNET ISTI NICHT DEM STRAHL AUSZUSTEKEN.
PRW102

**CAUTION
INVISIBLE LASER
RADIATION WHEN OPEN,
AVOID EXPOSURE
TO BEAM**
PRW1018

HEM and HEWM types

HB type

Additional Laser Caution

1. Laser Interlock Mechanism

The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state). Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.

Also, in the test mode*, the interlock mechanism does not operate too.

Laser diode oscillation will continue if pins 2 and 3 of CXA14715 (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

* Refer to page 36.

2. EXPLODED VIEWS AND PARTS LIST

NOTES :

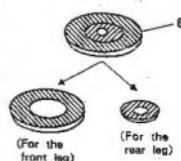
- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

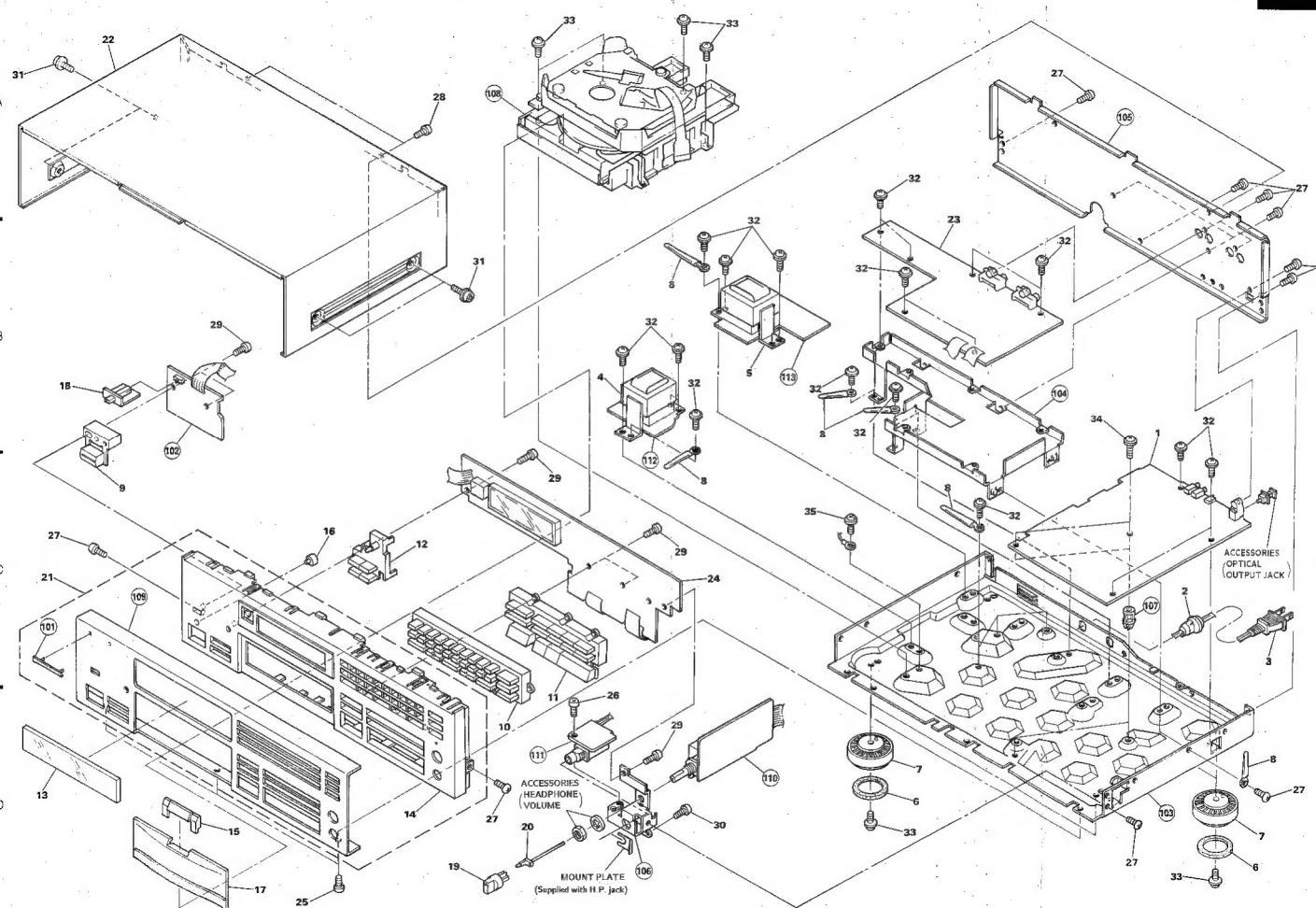
2.1 EXTERIOR

Parts List of Exterior

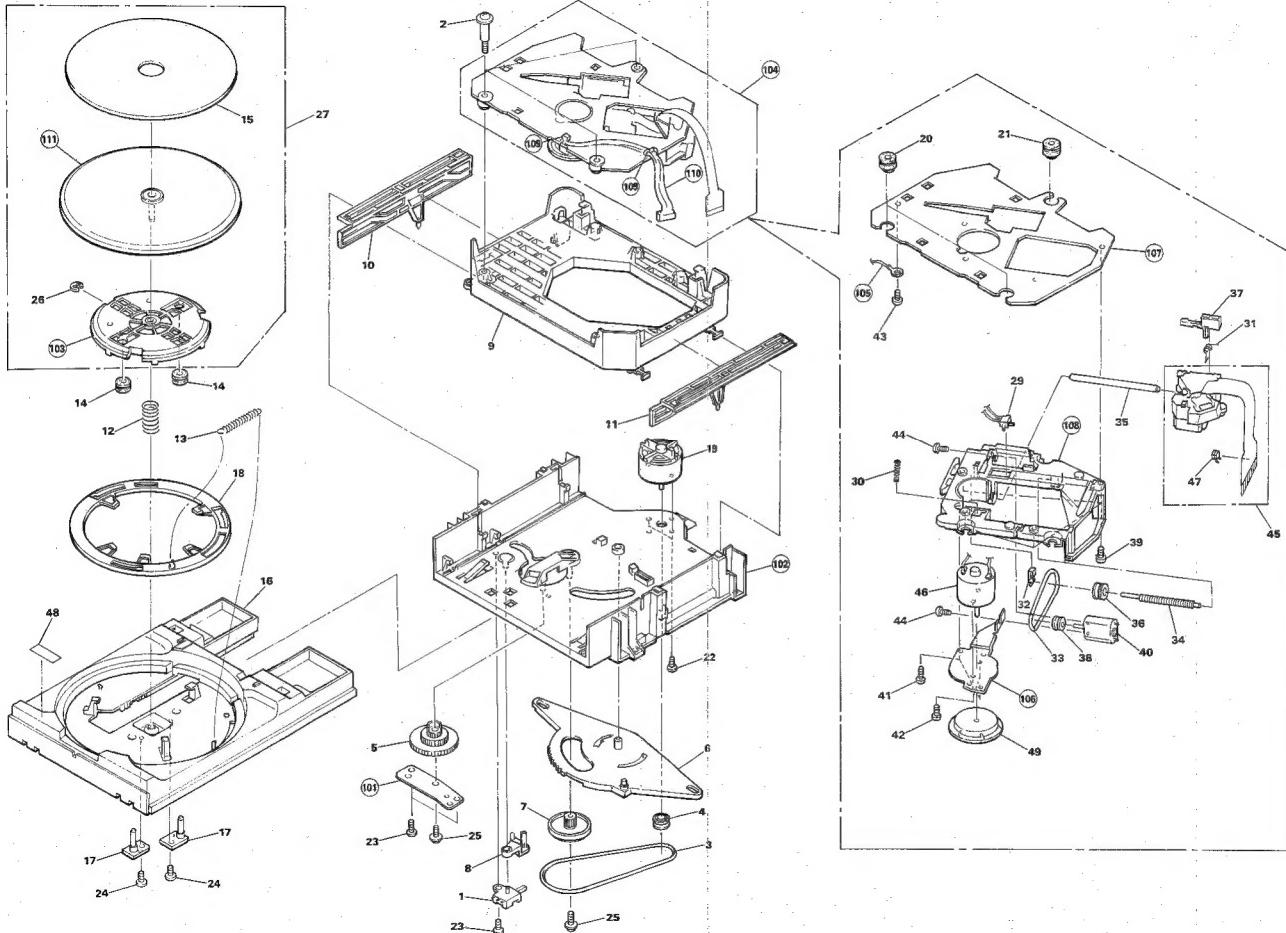
Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
▲ ● 1	Mother board assembly	PWM1448	101	Name plate(ABS)	
▲ 2	Strain relief	CM-22C	102	SW board assembly	
▲ 3	AC power cord	PDG1015	103	Under base	
▲ 4	Power transformer S(AC120V)	PTT1179	104	Audio angle	
▲ 5	Power transformer A(AC120V)	PTT1183	105	Rear base	
6 Stopper	PNM1134	106	Headphone angle		
7 Insulator	PNW2020	107	Spacer		
8 Cord clamps	RNH-184	108	Loading mechanism assembly		
9 Power button	PAC1569	109	Front panel		
10 Select button	PAC1570	110	Headphone board assembly		
11 Play button	PAC1571	111	Jack board assembly		
12 Search button	PAC1572	112	S trans board assembly		
13 Search window	PAM1503	113	A trans board assembly		
14 Control panel	PNW1948				
15 Tray lens	PNW1950				
16 LED lens	PNW2019				
17 Tray panel	PNW2055				
18 Slide knob	RAC1428				
19 Knob C	RAC1608				
20 BIAS lens	RNK1674				
21 Front panel assembly	PEA1164				
22 Bonnet	PYY1148				
● 23 Audio board assembly	PWZ2118				
● 24 Operate board assembly	PWZ2112				
25 Screw	BZT30P080FZK				
26 Screw	BBZ30P060FMC				
27 Screw	BBZ30P080FCC				
28 Screw	BBZ30P080FCC				
29 Screw	BBZ30P120FMC				
30 Screw	BBZ30P120FMC				
31 Screw	PBT40P080FZK				
32 Screw	IBZ30P060FCC				
33 Screw	IBZ30P080FCC				
34 Screw	IBZ30P150FCC				
35 Screw	PDZ30P060FCC				

* The stopper consist of the big ring part and the small ring part.
If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.





2.2 MECHANISM SECTION

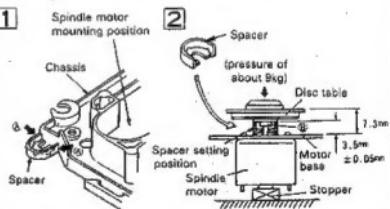


Parts List of Mechanism section

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
1	Lever switch	DSK1003		101	Shaft holder		
2	Screw(steel)	PBA1027		102	Loading base		
3	Rubber belt	PEB11186		103	Table bearings assembly		
4	Motor pulley	PNW1634		104	Servo mechanism assembly		
5	Drive gear	PNW1996		105	Earth lead unit(300V)		
6	Timing lever	PNW1997		106	Motor base		
7	Gear pulley	PNW1998		107	Mechanism base		
8	SW head	PNW1999		108	Mechanism chassis		
9	Floating base	PNW2000		109	Clamper		
10	Left cam	PNW2001		110	Connector assembly		
11	Right cam	PNW2002		111	Turn table(AL)		
12	Compression spring	PBB1120					
13	Tension spring	PBB1121					
14	Float(rubber)	PEB1014					
15	Table rubber sheet	PEB1181					
16	Tray	PNW2003					
17	Table guide	PNW2004					
18	Lock plate	PNW2005					
19	DC motor(0.75W)	PXM1010					
20	Rubber bush	PEB1031					
21	Rubber bush	PEB1170					
22	Screw	BMZ26P040FMC					
23	Screw	BPZ26P060FMC					
24	Screw	BPZ26P060FMC					
25	Screw	IPZ20P080FMC					
26	Stop ring	YE205					
27	Turn table assembly	PEA1165					
28	Push switch	DSG1014					
29	Spring	PBH1009					
30	Spring	PBH1084					
31	Spring						
32	Plat spring	PBX1057					
33	Belt(square)	PEB1072					
34	Screw	PLA1003					
35	Guide bar	PLA1071					
36	Pulley	PNW1066					
37	Half nut	PNW1605					
38	Motor pulley	PNW1634					
39	Screw	PBZ20P080FMC					
40	DC motor(1.7W)	PXM1013					
41	Screw	BPZ20P080FZK					
42	Screw	JFZ20P025FMC					
43	Screw	PBZ20P060FMC					
44	Screw	PMZ20P030FMC					
45	Pick up assembly	PEA1030					
46	DC motor assembly(With oil)	PEA1156					
47	Semi-fixed VR(3.3K)	PCP1008					
48	Caution label	PRW1244					
49	Disc table	PNW1067					

• How to install the disc table

- [1] Use nippers or other tool to cut the two sections marked ① in figure [1]. Then remove the spacer.
- [2] While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section ②), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers. (Figs. 1 and 2)

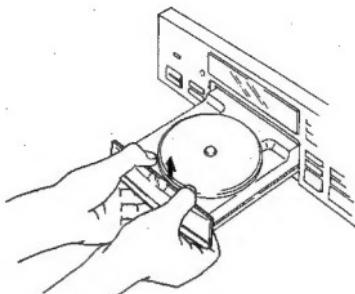


Fig. 1

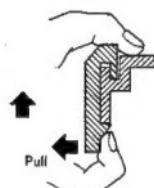


Fig. 2

2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with your fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

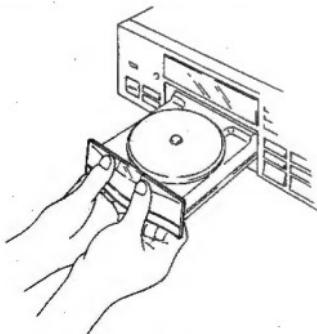


Fig. 4

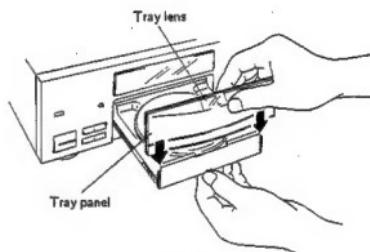


Fig. 3

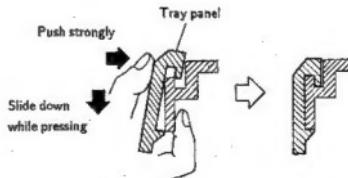


Fig. 5

3. P.C.B.'s PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10² 561 RD1/4PS[5][6][1]J

47kΩ 47 × 10³ 473 RD1/4PS[4][7][8]J

0.5Ω 0R5 RD2H[0][R][5]K

1Ω 010 RD1P[0][1][0]K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.68kΩ 562 × 10³ 5621 RD1/4SR[5][6][2]F

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
●MOTHER BOARD ASSEMBLY					
(PWM144B : PD-31/KU type)					
(PWM1449 : PD-8700/HEM, HB, SD and PD-8700-S/HEWM types)					
SEMICONDUCTORS					
▲	IC20 REGULATOR IC	M5298P	C104	ELECTR.CAPACITOR	CEAS101M10
	IC101 PRE AMP IC	CXA1471S	C110	CERAMIC CAPACITOR	CKCYF103Z50
	IC151 SERVO IC	CXA1372S	C151-C153 ELECTR.CAPACITOR	CEAS101M10	
▲	IC201,IC202 POWER OP-AMP,IC	LA6520	C155	CERAMIC CAPACITOR	CKCYB182K50
	IC301 EFM DEMODULATION IC	CXD2500AQ	C156	CERAMIC CAPACITOR	CGCYX388K25
	Q101 TRANSISTOR	2SA848S	C157	CERAMIC CAPACITOR	CGCYX108K25
	Q321,Q351 TRANSISTOR	DTC124ES	C158,C159 CERAMIC CAPACITOR	CGCYX104K25	
	Q381 TRANSISTOR	2SC1740S	C160	ELECTR.CAPACITOR	CEAS487M50
	Q406 TRANSISTOR	DTA124ES	C161	CERAMIC CAPACITOR	CGCYX104K25
			C162	ELECTR.CAPACITOR	CEAS601M50
△	D11-D14,D52 DIODE	11ES2	C163	CERAMIC CAPACITOR	CGCYX104K25
	D54 ZENNER DIODE	MT2J18B	C164	CERAMIC CAPACITOR	CGCYX108K25
	D801 DIODE	1SS254	C167	CERAMIC CAPACITOR	CKCYF108Z50
	D891-D894 DIODE(PWM1448 only)	1SS254	C168	CERAMIC CAPACITOR	CGCYX388K25
	D895-D897 DIODE	1SS254	C169	CERAMIC CAPACITOR	CGCYX108K25
△	C170 CERAMIC CAPACITOR	CKCYB382K50			
	C171,C172 CERAMIC CAPACITOR	CKCYB472K50			
	C202,C207 CERAMIC CAPACITOR	CKCYF103Z50			
	C212 CERAMIC CAPACITOR	CKCYB272K50			
	C216,C217 ELECTR.CAPACITOR	CEAS830M16			
COILS					
	L391,L392 AXIAL INDUCTOR	LAUR22K	C301	CERAMIC CAPACITOR	CGCYX104K25
	L393,L394 AXIAL INDUCTOR	LAU010K	C302	ELECTROLYTIC CAPACIT	CEAS471M6R3
CAPACITORS					
	C11,C13 CERAMIC CAPACITOR	CKCYF103Z50	C304	CERAMIC CAPACITOR	CKCYB182K50
	C15,C16 CERAMIC CAPACITOR	CKCYF103Z50	C307	CERAMIC CAPACITOR	CGCYX473K25
	C25 ELECTR.CAPACITOR	CEAS332M16	C308	CERAMIC CAPACITOR	CGCYX108K25
	C26 ELECTR.CAPACITOR	CEAS222M16	C309	ELECTR.CAPACITOR	CEAS487M50
	C27 ELECTROLYTIC CAPACIT	CEAS471M6R3	C310	CERAMIC CAPACITOR	CKCYF103Z50
	C28 ELECTR.CAPACITOR	CEAS101M10	C321	CERAMIC CAPACITOR	CGCYX104K25
	C52 ELECTR.CAPACITOR	CEAS101M35	C324	CERAMIC CAPACITOR	CKCYF103Z50
	C60 ELECTR.CAPACITOR	CEAS101M50	C361	CERAMIC CAPACITOR	CKCYF103Z50
	C101,C102 ELECTR.CAPACITOR	CEAS101M10			
	C103 CERAMIC CAPACITOR	CCCCH200J50	C362	CERAMIC CAPACITOR	CKCYB102K50
			C397	CERAMIC CAPACITOR	CKCYF103Z50
RESISTORS					
	VR102 VR	VRTB6VS223			
	VR103 VR	VRTB6VS102			
	VR151,VR152 VR	VRTB6VS223			
	Other resistors	RD1/6PM[] [] []			

PD-31, PD-8700
PD-8700-S

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
OTHERS			CAPACITORS		
CN101 CONNECTOR	52045-1610		C503, C504 CERAMIC CAPACITOR	CKCYF103Z50	
CN404 CONNECTOR(7P)	KPC7				
JA301 OPTICAL OUTPUT JACK	TO1X178		RESISTORS		
JA391, JA392 JACK/12V	PKN1004 (PWMI448 only)		VR501 VARIABLE RESISTOR WITH MOTOR 20KB	PCS1006	
JA393 JACK	PKN1005		Other resistors	RD1/6PM□□□J	
● OPERATE BOARD ASSEMBLY (PWZ2112)					
SEMICONDUCTORS			JACK BOARD ASSEMBLY		
IC701 MICROCOMPUTER,IC	PD4329A		COILS	L501-L503 AXIAL INDUCTOR	LAU010K
Q801, Q802 TRANSISTOR	2SD2144S				
Q803, Q804 TRANSISTOR	2SB1296		CAPACITORS	C505-C507 CERAMIC CAPACITOR	CKCYF103Z50
Q805, Q806 TRANSISTOR	2SD2144S				
Q807-Q809 TRANSISTOR	DTA124ES		OTHERS	JA501 JACK	PKN1001
Q810 TRANSISTOR	DTC124ES				
D701-D714 DIODE	ISS254		● AUDIO BOARD ASSEMBLY (PWZ2118)		
SWITCHES			SEMICONDUCTORS		
S701-S742 SWITCH	PSG1006		IC801, IC802 D/A CONVERTER,IC	PD9026A	
- 1-20, PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, 0/L, HI LITE SCAN, AUTO SPACE, COMPU, TIME FADE, <<, >>, <>, >> STOP(□), PLAY(>)			IC803 LOGIC IC	TC74HCU04AP	
			IC808, IC809 OP-AMP IC	NJM5532DD	
			IC901 REGULATOR IC	NJM78L12A	
			IC902 REGULATOR IC	NJM79L12A	
			IC903 REGULATOR IC	NJM7805FA	
CAPACITORS					
CT01 ELECTR.CAPACITOR	CEAS330M16		A D802-D804, D805 DIODE	ISS254	
CT02-C714 AXIAL CAPACITOR	CKPUYB221K30			11ES2	
RESISTORS	All resistors	RD1/6PM□□□J			
OTHERS					
PHOTO SENSOR UNIT	GPU150X				
V701 FL INDICATOR TUBE	PEL1057				
X701 CERAMIC RESONATOR	VSS1014				
SW BOARD ASSEMBLY					
SEMICONDUCTORS					
D715 LED	PCX1018				
SWITCHES					
S743-S748 SWITCH (ON/STN BY, FADE IN(¬), FADE OUT(¬), ←, →, DISPLAY OFF)	PSG1006				
S749	RSH1017				
RESISTORS					
R710 CARBON FILM RESISTOR	RD1/6PM103J				
HEADPHONE BOARD ASSEMBLY					
SEMICONDUCTORS					
IC501 OP-AMP,IC	M5218AL				

<u>Mark</u>	<u>No.</u>	<u>Description</u>	<u>Parts No.</u>
RESISTORS			
	All resistors		RD1/6PM[<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>]
OTHERS			
CN801	CONNECTOR(9P)	KPC09	
JA801	JACK	PKB1010	
JA802	JACK	PKB1010	
X801	XTAL RES (OSC)	PSS1006	

S. TRANS BOARD ASSEMBLY

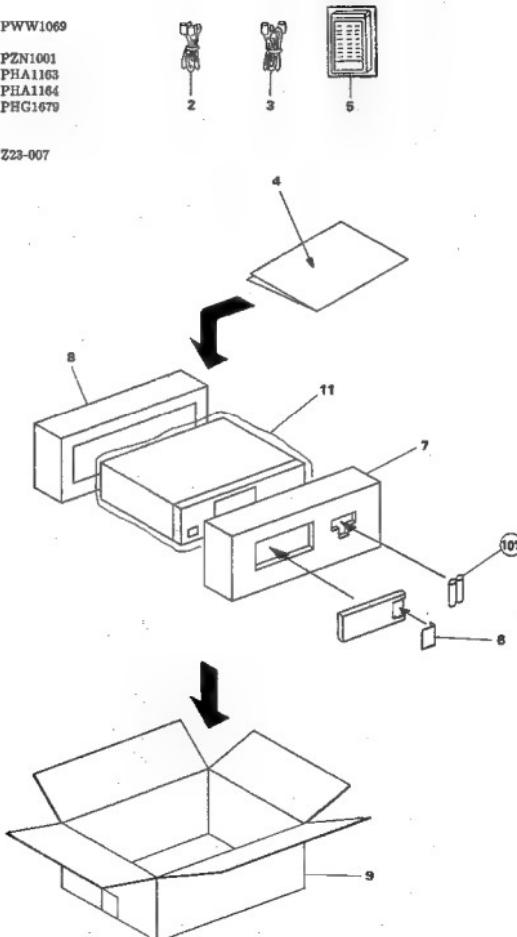
No electrical parts are supplied this assembly.

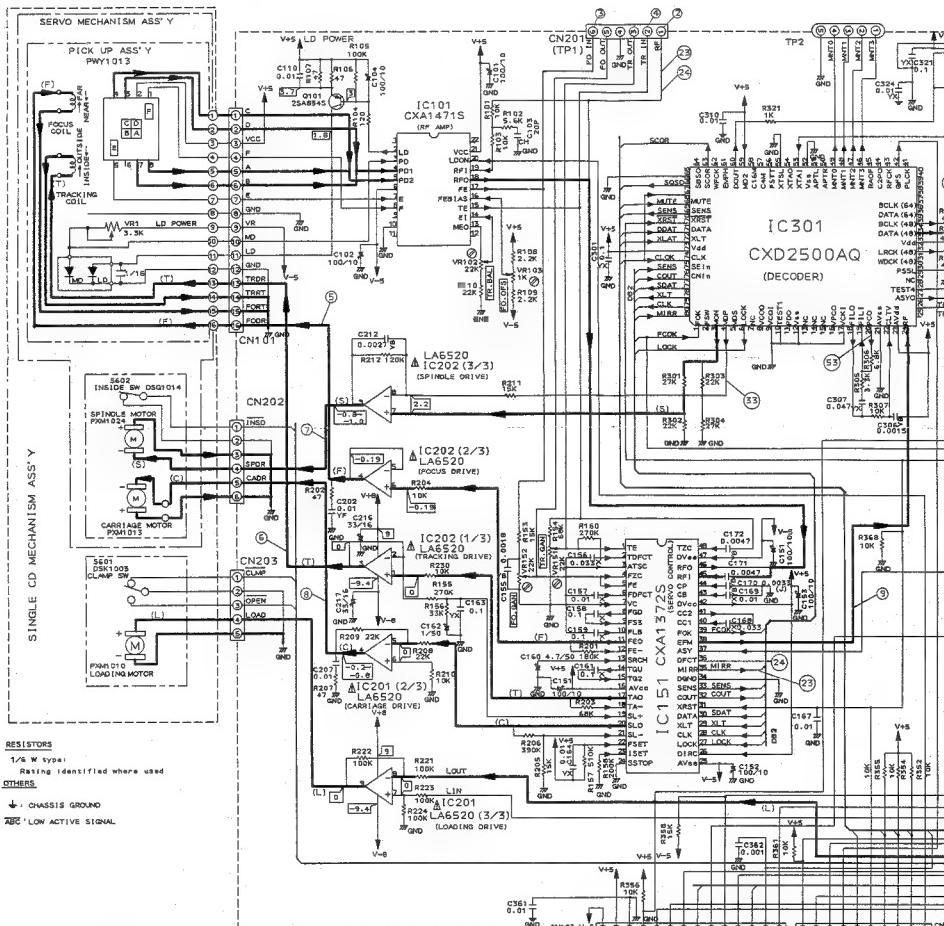
A. TRANS BOARD ASSEMBLY

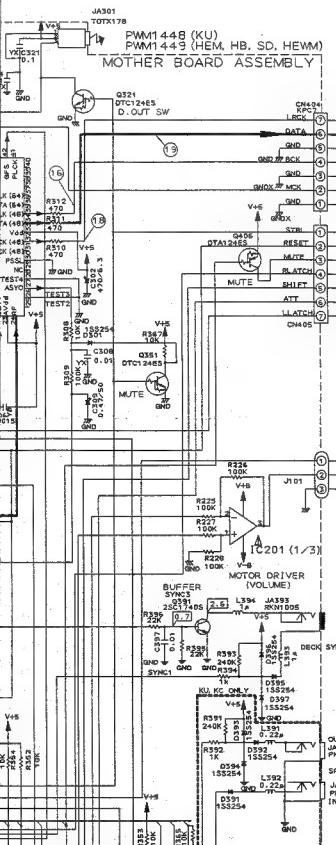
No electrical parts are supplied this assembly.

4. PACKING

Mark	No.	Description	Parts No.
1			
2		Cord with plug(mini plug)	PDE-319
3		Cord with plug	PDE1001
4		Operating instructions (English)	PRB1151
5		Remote control unit (CU-PD053)	PWW1069
6		Battery lid	PZN1001
7		Styrol protector F	PHA1163
8		Styrol protector R	PHA1164
9		CD Packing case	PHG1679
10			
11		Sheet	Z23-007
101		Mangan battery(R03, AAA)	

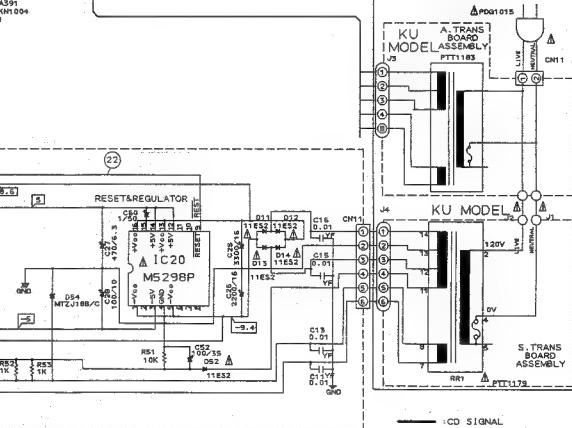
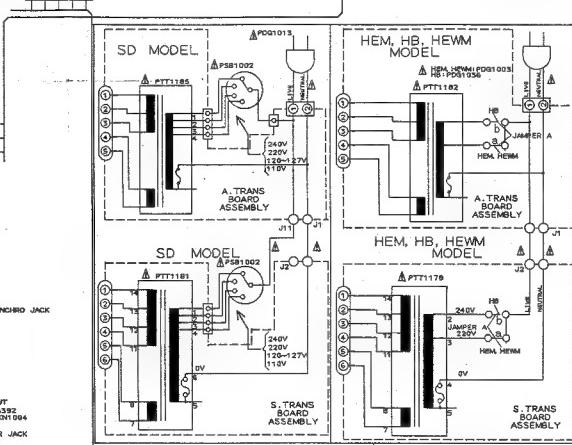
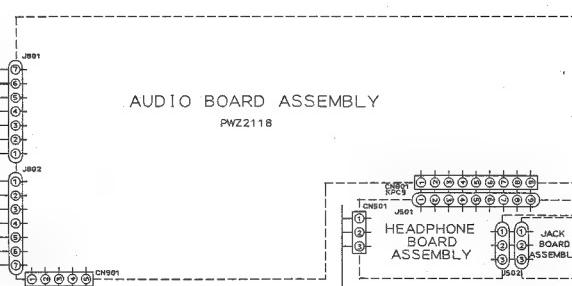






AUDIO BOARD ASSEMBLY

DMZ2448

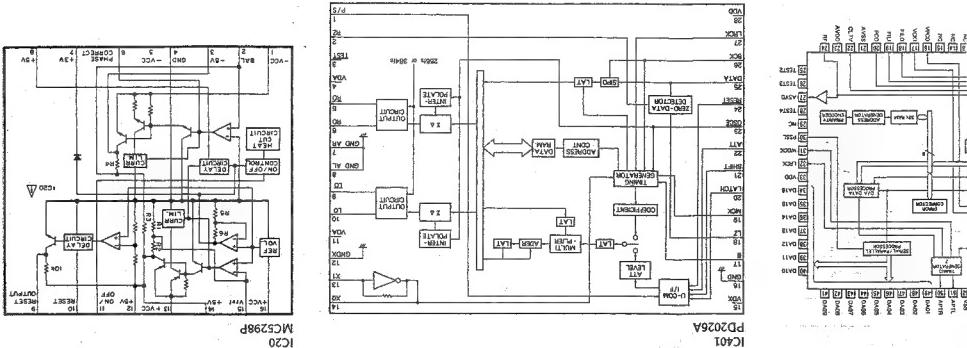


- CD SIGNAL
 - FOCUS SERVO SIGNAL
 - TRACKING SERVO SIGNAL
 - SPINDLE SERVO SIGNAL
 - CARRIAGE SERVO SIGNAL
 - LOADING SERVO SIGNAL

Print	Line	Voltage	Print	Line	Voltage
1	0	25	5	-5	
2	0	26	5		
3	0	27	5		
4	0	28	5		
5	0	29	5		
6	0	30	5		
7	0	31	5		
6	0	32	0		
8	0	33	5		
10	0	34	0		
11	1	35	5		
12	0	38	R.C.		
13	0	24	5		
14	0	25	5		
15	0	28	5		
16	5	49	-1.5		
17	0	41	-1.7		
18	0	42	5		
19	0	43	-0.7		
20	0, 2, 3	46	-4.4		
21	0	45	0		
22	-4	46	0.8		
23	1, 3	47	1		
24	0	48	0		

IC01 (CONTINUATION)		Rate	Velocity
IC	IC	km/s	km/s
1	I	41	4.5
2	IC-4	41	4.5
3	IC-5	41	4.5
4	2	44	4.4
5	IC-1	45	4.5
6	3	46	4.4
7	IC-2	46	4.4
8	IC-3	46	4.0
9	0	49	0 + 2.3
10	0	50	4.5
11	IC-1	50	5.1
12	IC-2	50	5.1
13	IC-3	52	2.5
14	IC-4	54	2.5
15	IC-5	55	2.5
16	1	55	2.5
17	0	51	4.5
18	1	55	4.5
19	2	54	5.5
20	3	54	5.5
21	4	54	5.5
22	5	54	5.5
23	2	55	4.5
24	3	55	4.5
25	4	55	4.5
26	5	55	4.5
27	6	55	4.5
28	7	55	4.5
29	8	55	4.5
30	9	55	4.5
31	0	55	4.5
32	1	55	4.5
33	2	55	4.5
34	3	55	4.5
35	4	55	4.5
36	5	55	4.5
37	6	55	4.5
38	7	55	4.5
39	8	55	4.5
40	9	55	4.5
41	0	55	4.5
42	1	55	4.5
43	2	55	4.5
44	3	55	4.5
45	4	55	4.5
46	5	55	4.5
47	6	55	4.5
48	7	55	4.5
49	8	55	4.5
50	9	55	4.5
51	0	55	4.5
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53	2	55	4.5
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55	4	55	4.5
56	5	55	4.5
57	6	55	4.5
58	7	55	4.5
59	8	55	4.5
60	9	55	4.5
61	0	55	4.5
62	1	55	4.5
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68	7	55	4.5
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71	0	55	4.5
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73	2	55	4.5
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75	4	55	4.5
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78	7	55	4.5
79	8	55	4.5
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81	0	55	4.5
82	1	55	4.5
83	2	55	4.5
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89	8	55	4.5
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91	0	55	4.5
92	1	55	4.5
93	2	55	4.5
94	3	55	4.5
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114	3	55	4.5
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122	1	55	4.5
123	2	55	4.5
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125	4	55	4.5
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161	0	55	4.5
162	1	55	4.5
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360	9	55	4.5
361	0	55	4.5
362	1	55	4.5
363	2	55	4.5
364	3	55	4.5
365	4	55	4.5
366	5	55	4.5
367	6	55	4.5</td

Pin No.	Voltages	Pin No.	Voltage
1	H. C.	12	H. C.
2	2.8	13	-0.8
3	-4.7	14	-0.7
4	D	15	0
5	D	16	0
6	-5	17	0
7	D	18	0.8
8	D	19	0
9	H. C.	20	5
10	D	21	5
11	H. C.	22	H. C.



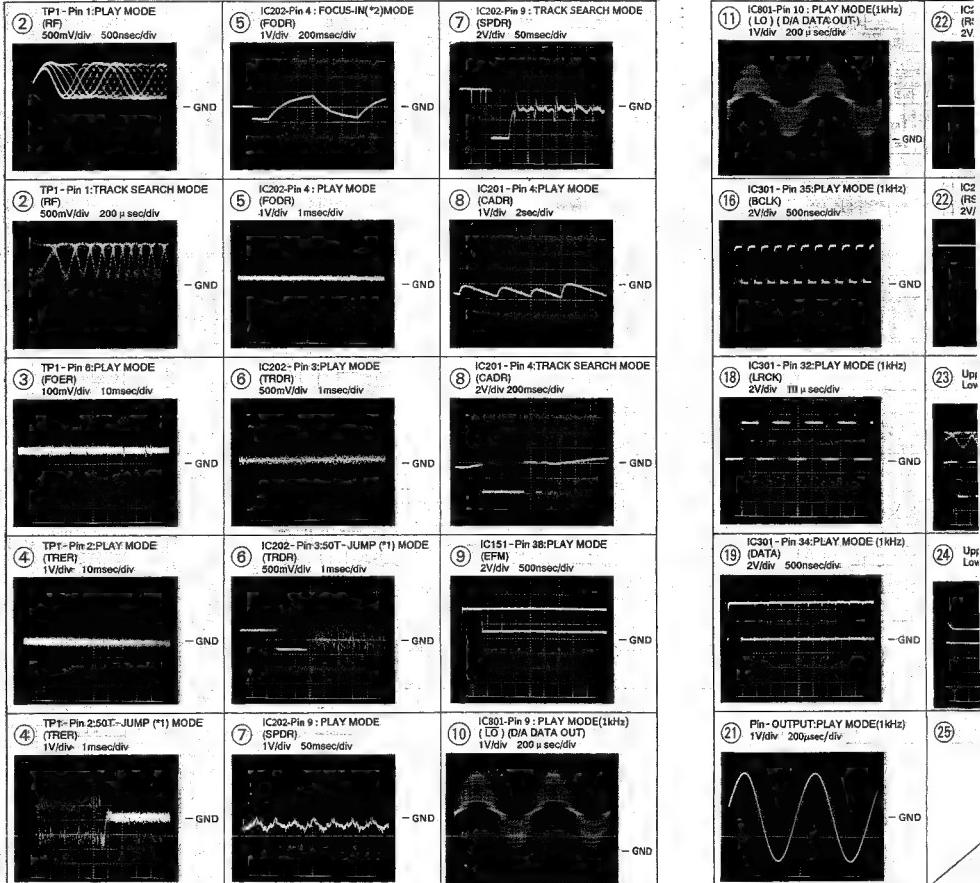
5. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

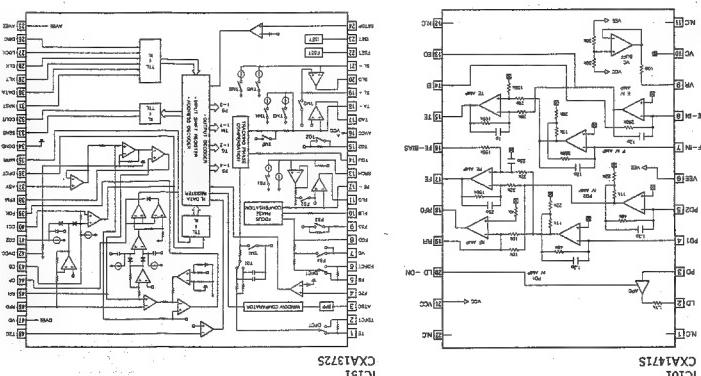
5.1 Wave Forms

Note: The encircled numbers denote measuring in the schematic diagram.

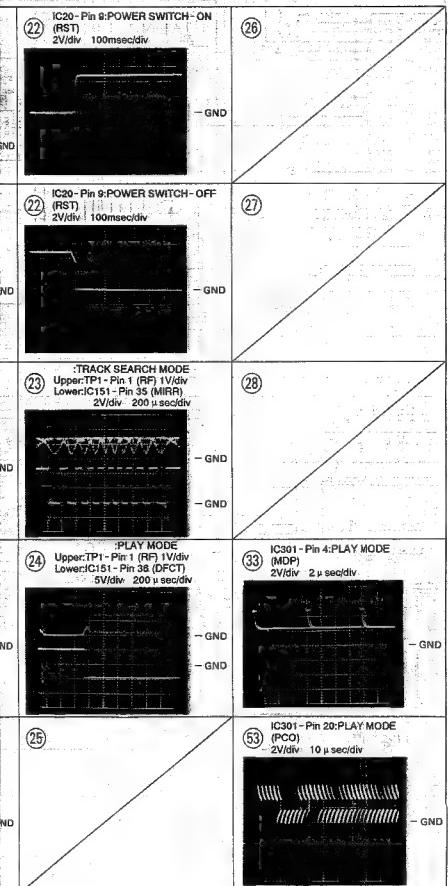
*1 SOT-JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS-IN: Press the key without loading a disc.





• IC BLOCK DIAGRAM



1. RESISTORS:

Indicated in ohms (Ω) 1/4W, 1/8W, 1/16W and 1/32W, $\pm 20\%$ tolerance unless otherwise noted.
k; k2M; M Ω (F); $\pm 1\%$; (G); $\pm 2\%$; (K); $\pm 10\%$; (M); $\pm 20\%$ tolerance.

2. CAPACITORS:

Indicated in capacity (μF)/voltage(V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:

\square : DC voltage (V) at play state.
 \square_{DC} : DC current at play state.
Value in \square is DC current at stop state.

4. OTHERS:

→ : Signal route.

② : Pin number point.

The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underlined indicates the switch position)

SWITCH BOARD ASSEMBLY

S743 : POWER ON-OFF

OPERATE BOARD ASSEMBLY

S701 : 1	S725 : >20
S702 : 2	S726 : RESERVE
S703 : 3	S727 : REPEAT
S704 : 4	S728 : TIME
S705 : 5	S729 : RND
S706 : 6	S730 : PEAK SEARCH
S707 : 7	S731 : O/L
S708 : 8	S732 : WHITE SCAN
S709 : 9	S733 : AUTO SPACE
S710 : 10	S734 : COMPR
S711 : 11	S735 : TIME FADE] EDI
S712 : 12	S736 : \triangle] MANUAL SEARCH
S713 : 13	S737 : \square] TRACK SEARCH
S714 : 14	S738 : \diamond] TRACK SEARCH
S715 : 15	S739 : \square]
S716 : 16	S740 : STOP(\square)
S717 : 17	S741 : PAUSE(\square)
S718 : 18	S742 : PLAY(\square)
S719 : 19	(S743 : ON/STN BY)
S720 : 20	S744 : FADE (+/-)
S721 : PGM	S745 : FADE OUT(-)
S722 : DELETE	S746 : \leftarrow INDEX
S723 : CHECK	S747 : \rightarrow INDEX
S724 : CLEAR	S748 : DISPLAY OFF

Line Voltage Selection (For HB, HEM and HEWM types)

Line voltage can be changed with the following steps.

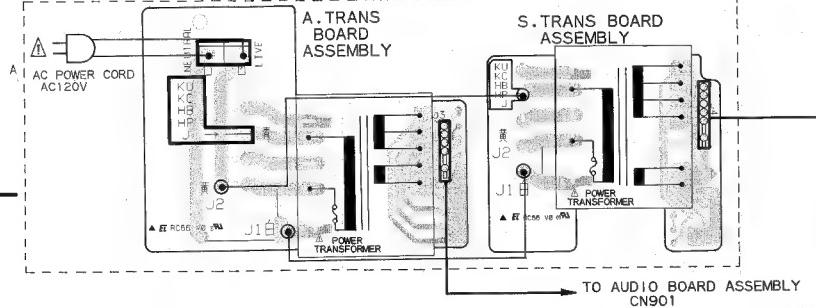
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

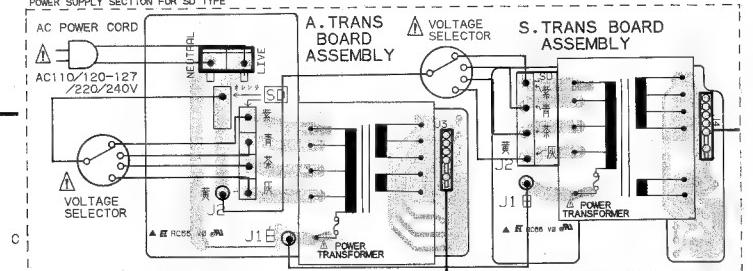
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

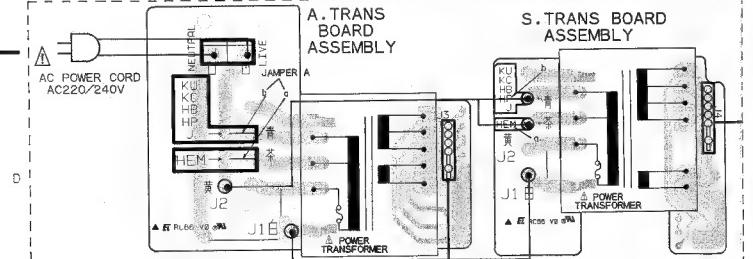
POWER SUPPLY SECTION FOR KU TYPE



POWER SUPPLY SECTION FOR SD TYPE

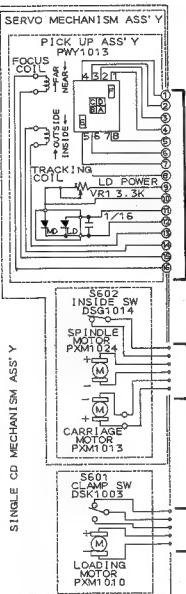


POWER SUPPLY SECTION FOR HEM, HB AND HEWM TYPES

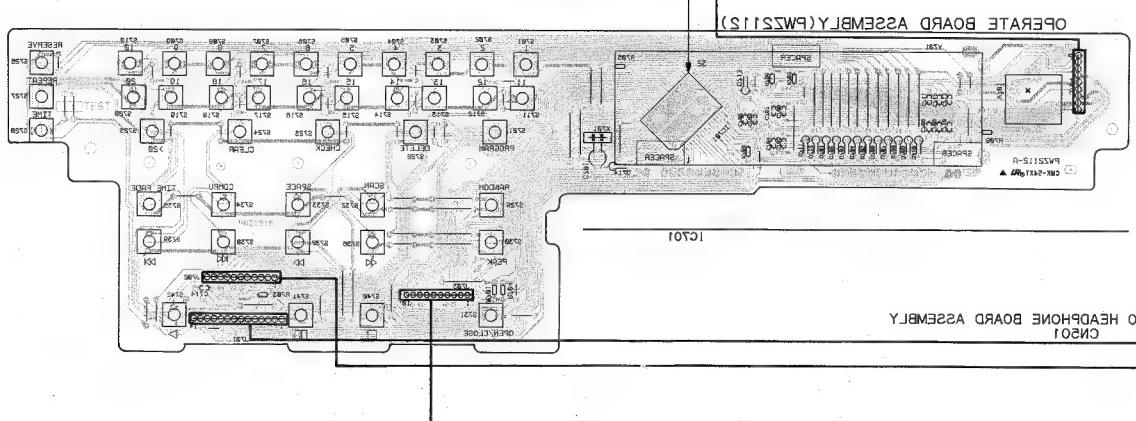


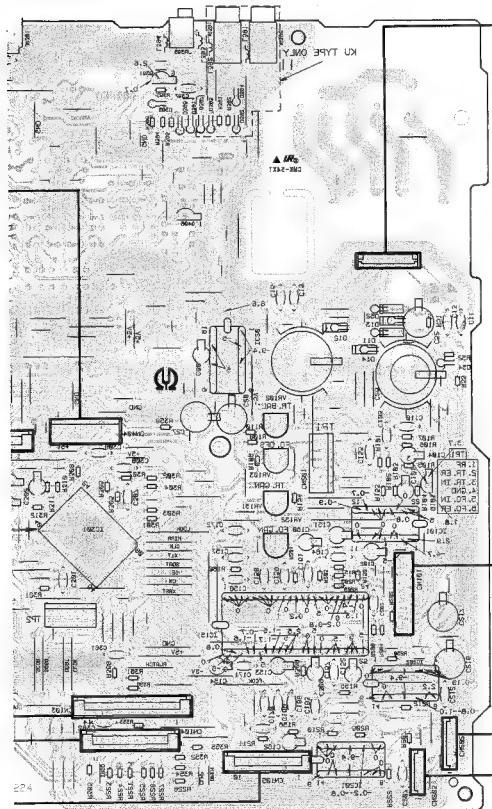
MOTHER BOARD ASSEMBLY

(PWM1448:KU TYPE)
(PWM1449:HEM,HB,SD AND HEWM TYPES)

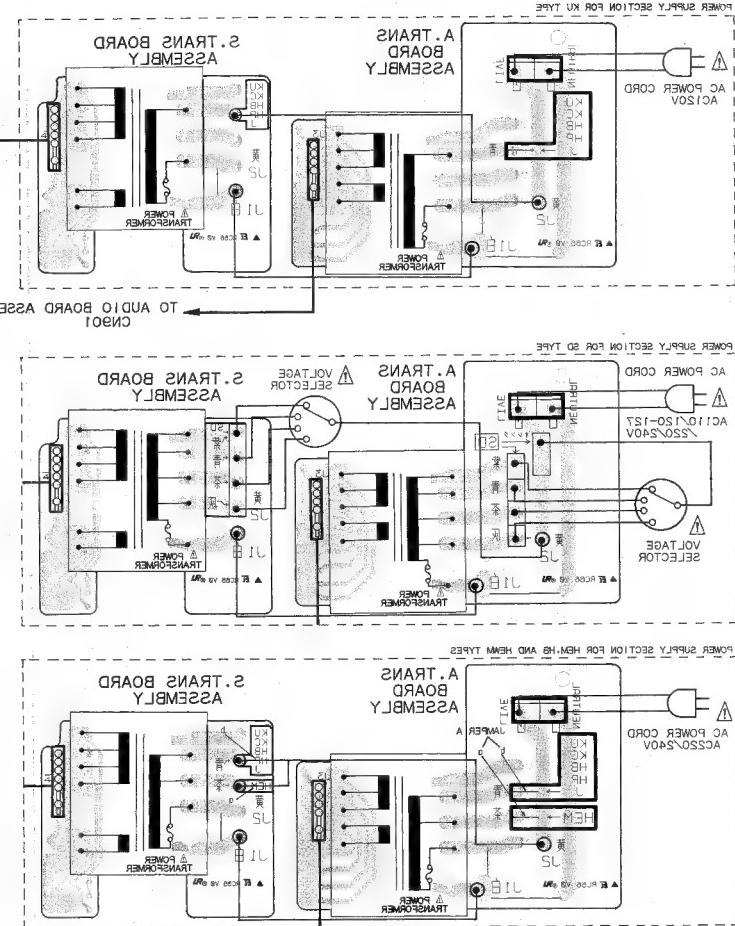


A



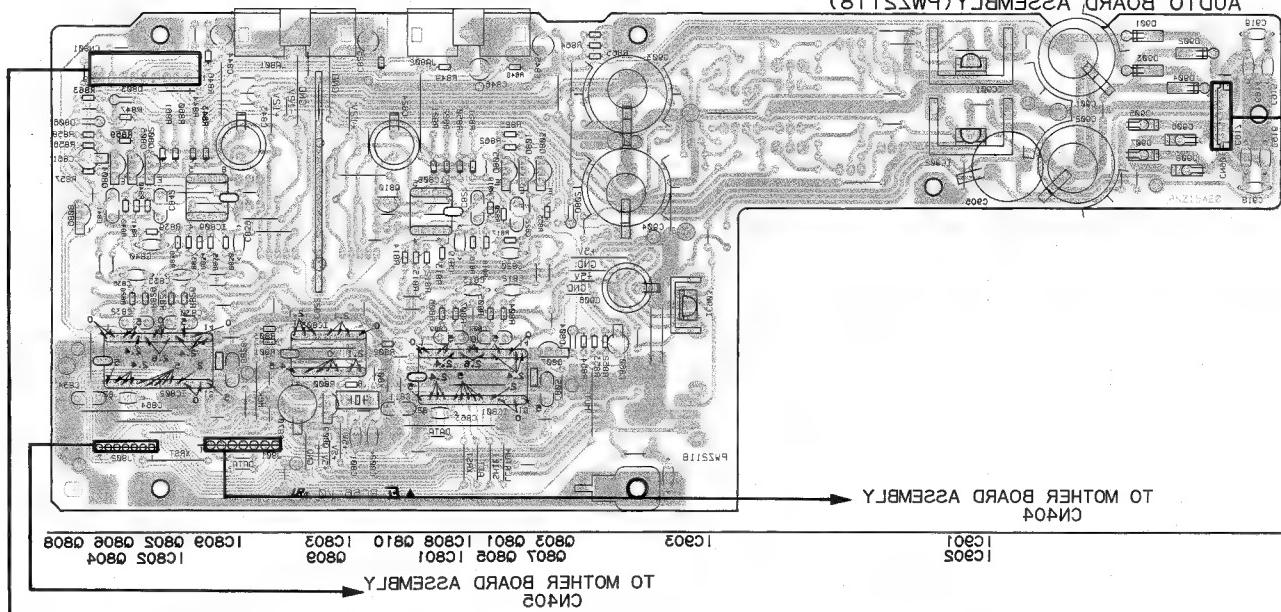


(BMW 448:HEW,HB,SD AND HEMM TYPES)
(BMW 448:KU TYPE)
MOTHER BOARD ASSEMBLY



This P.C.B. connection diagram is viewed from the foil side.

AUDIO BOARD ASSEMBLY (PM25118)



TO
S.
ASSEMBLY
13

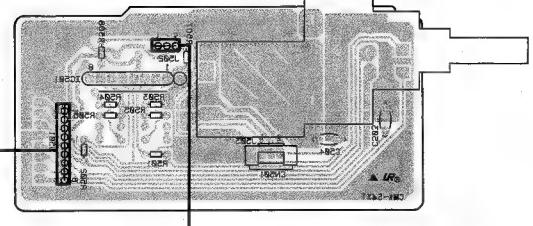
CN404
TO MOTHER BOARD ASSEMBLY

C903

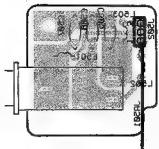
C903

CN402
TO MOTHER BOARD ASSEMBLY

HEADPHONE BOARD ASSEMBLY



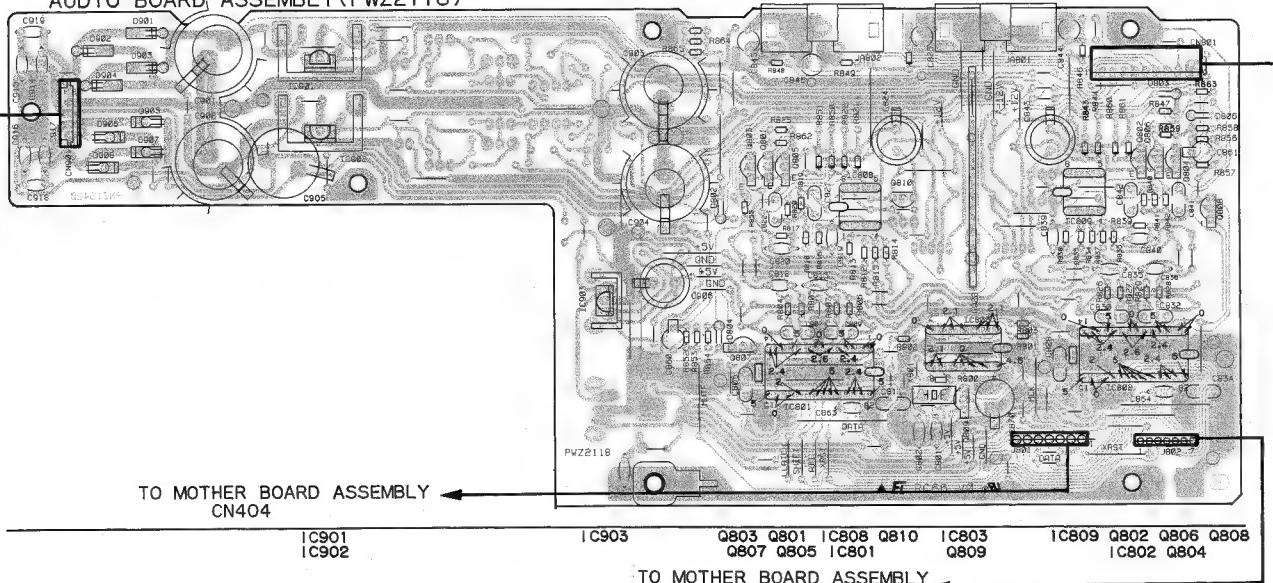
JACK BOARD
ASSEMBLY



2

3

AUDIO BOARD ASSEMBLY (PWZ2118)



TO MOTHER BOARD ASSEMBLY
CN404

IC901
IC902

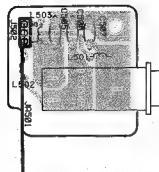
| C903

Q803 Q801 IC808 Q810 IC80
Q807 Q805 IC801 Q809

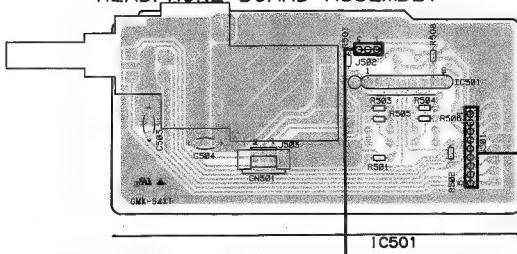
IC809 Q802 Q806 Q808
IC802 Q804

TO MOTHER BOARD ASSEMBLY
CN405

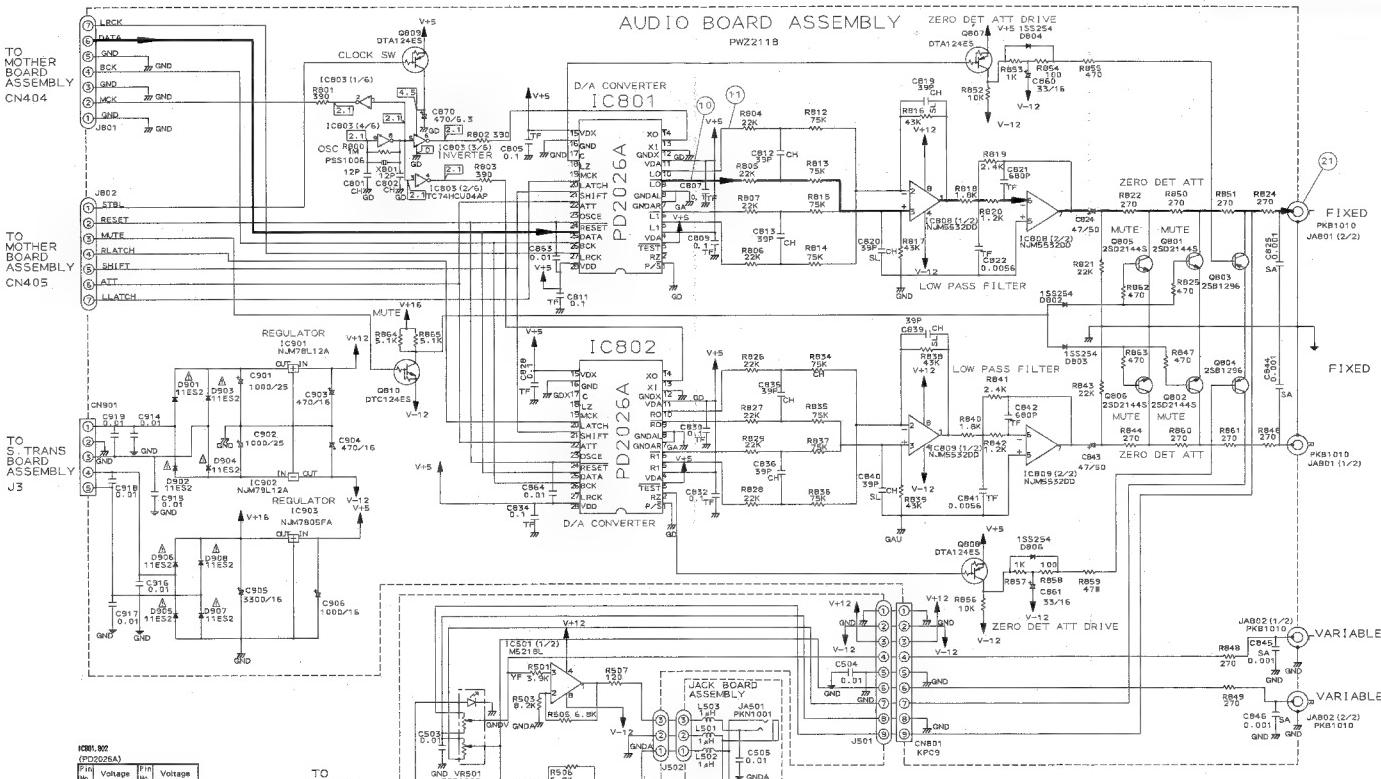
JACK BOARD ASSEMBLY



HEADPHONE BOARD ASSEMBLY



1C501



Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	0
3	5	17	N.C.
4	5	18	0
5	2.4	19	2
6	2.8	20	5
7	0	21	5
8	0	22	5
9	2.6	23	5
10	2.4	24	6
11	5	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	5	28	5

TO
MOTHER
BOARD
ASSEMBLY
J101

GNDV HEADPHONE AMP
HEADPHONE BOARD ASSEMBLY

RESISTORS

6. ADJUSTMENTS

6.1 ADJUSTMENT METHODS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6(FCS. ERR)	VR103(FCS. OFS)
2	Gating adjustment	TP1, Pin 2(TRK. ERR)	Gating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2(TRK. ERR)	VR102(TRK. BAL.)
4	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1(RF)	VR1(RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5(FCS. IN) TP1, Pin 6(FCS. ERR)	VR152(FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3(TRK. IN) TP1, Pin 2(TRK. ERR)	VR151(TRK. GAN)
8	Focus error signal verification	TP1, Pin 6(FCS. ERR)	_____

● Abbreviation table

FCS. ERR	:Focus Error
FCS. OFS	:Focus Offset
TRK. ERR	:Tracking Error
TRK. BAL	:Tracking Balance
FCS. GAN	:Focus Gain
TRK. GAN	:Tracking Gain
FCS. IN	:Focus In
TRK. IN	:Tracking In

● Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes recording)
5. Low-pass filter ($39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$)
6. Resistor ($100\text{ k}\Omega$)
7. Hexagonal wrench (M3 mm)
8. Standard tools

● Test point and adjustment variable resistor positions

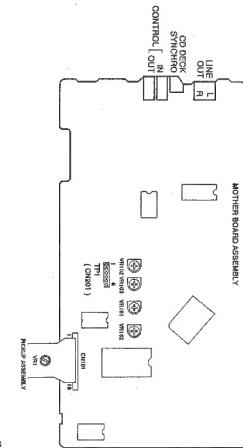


Figure 1 Adjustment Locations

● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

- How to set this model into test mode.
1. Unplug the power cord from the AC socket.
 2. Short the test mode jumper wires. (See Figure 1.)
 3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PROGRAM	Focus servo close	<p>The laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc.</p> <p>With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.</p>
▷	PLAY	Spindle servo ON	<p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.</p>
□□	PAUSE	Tracking servo close/open	<p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly; it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p>

Code	Key name	Function in test mode	Explanation
<<	MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
>>	MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
<input type="checkbox"/>	STOP	Stop	Switches off all the servos and initialized. The pickup remains where it was when this key was pressed.
<input type="checkbox"/>	OPEN/CLOSE	Disc tray open/close	Open/close the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.

PROGRAM Lights up the laser diode and closes the focus servo.

↓
PLAY ▶ Starts the spindle motor and closes the spindle servo.

↓
PAUSE ■ Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 6 (FCS. ERR) [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS. OFS) None needed

[Procedure]

Adjust VR103 (FCS. OFS) so that the DC voltage at TPI, Pin 6 (FCS. ERR) is -150 ± 50 mV.

2. Grating Adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 2(TRK. ERR) via a low pass filter. (See Figure 2)</p> <p>[Settings] 50 mV/division 5 ms/division DC mode</p>	<ul style="list-style-type: none"> ● Player state ● Adjustment location ● Disc 	<p>Test mode, focus and spindle servos closed and tracking servo open</p> <p>Pickup grating adjustment slit</p> <p>12-cm disc. (YEDS-7 can not be used.)</p>

[Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD $\triangleright\triangleright$ or REV $\triangleleft\triangleleft$ key.
2. Press the PROGRAM key, then the PLAY \triangleright key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

Note : The amplitude of the tracking error signal is about 3 Vp-p (when a $39 \text{ k}\Omega + 0.001 \mu\text{F}$ low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the MANUAL SEARCH REV $\triangleleft\triangleleft$ key, press the PAUSE $\square\square$ key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

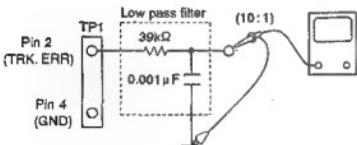
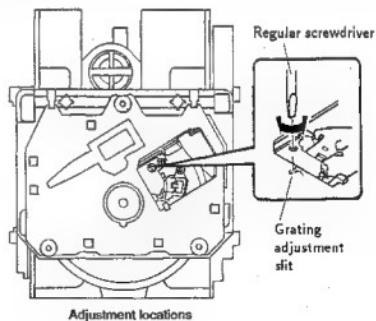


Figure 2



[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1, Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

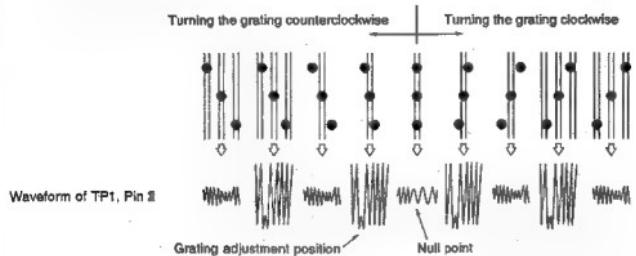
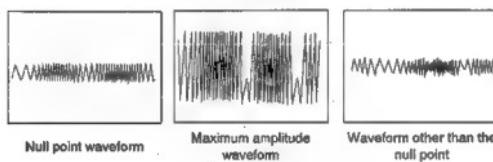


Figure 3

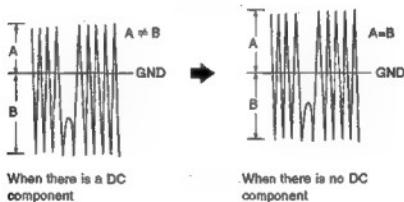


3. Tracking Error Balance Adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter.</p> <p>[Settings] 50 mV/division 5 ms/division DC mode</p>	<ul style="list-style-type: none"> ● Player state ● Adjustment location ● Disc 	<p>Test mode, focus and spindle servos closed and tracking servo open</p> <p>VR102 (TRK. BAL)</p> <p>YEDS-7</p>

[Procedure]

1. Move the pickup to midway across the disc ($R=35\text{ mm}$) with the MANUAL SEARCH FWD \gg or REV \ll key.
2. Press the PROGRAM key, then the PLAY \triangleright key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK. BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1, Pin 2 (TRK. ERR) are the same (in other words, so that there is no DC component).



4. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	<p>Connect the oscilloscope to TPI, Pin 1 (RF).</p> <p>[Settings] 20 mV/division 200 ns/division AC mode</p>	<ul style="list-style-type: none"> ● Player state ● Adjustment location ● Disc 	<p>Test mode, play</p> <p>Pickup radial tilt adjustment screw and tangential tilt adjustment screw</p> <p>12-cm disc. (YEDS-7 can not be used.)</p>

[Procedure]

1. Press the MANUAL SEARCH FWD ▶▶ or REV ◀◀ key so that the radial/tangential tilt screws can be adjusted. Press the PROGRAM key, the PLAY ▶ key, then the PAUSE III key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

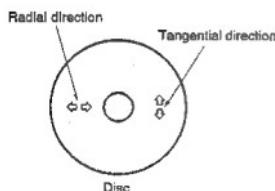
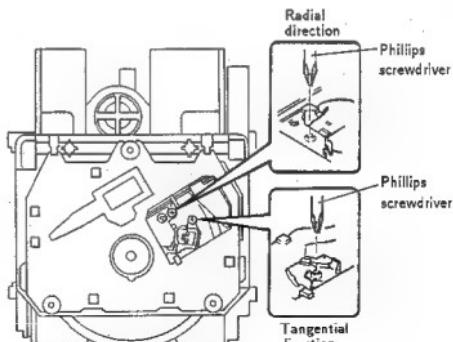


Figure 4



Adjustment locations

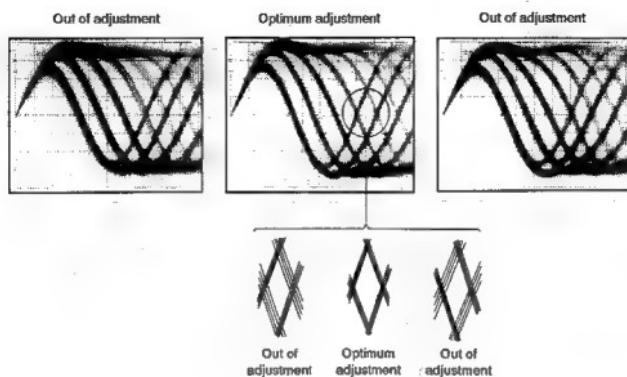


Figure 5 Eye pattern

5. RF Level Adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1(laser power) YEDS-7
[Procedure]			
<ol style="list-style-type: none"> Move the pickup to midway across the disc ($R=35$ mm) with the MANUAL SEARCH FWD \gg or REV \ll key, then press the PROGRAM key, then the PLAY \triangleright key in that order to close the respective servos and put the player into play mode. Adjust VR1 (laser power) so that the RF signal amplitude is $1.2\text{ V}_{\text{p-p}} \pm 0.1\text{ V}$. 			

6. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	<p>See figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode</p>	<ul style="list-style-type: none"> ● Player state ● Adjustment location ● Disc 	<p>Test mode, play</p> <p>VR152 (FCS. GAN)</p> <p>YEDS-7</p>

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL SEARCH FWD \gg or REV \ll key to move the pickup to halfway across the disc ($R=35$ mm), then press the PROGRAM key, the PLAY \triangleright key, then the PAUSE $\|\!$ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

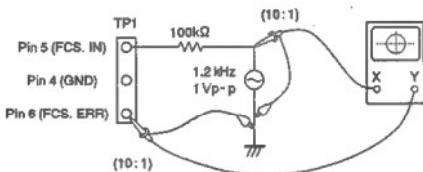
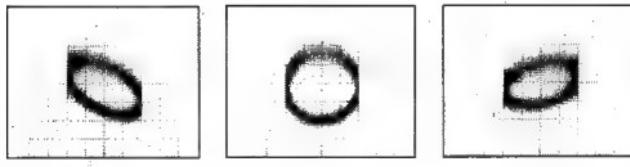


Figure 6

Focus Gain Adjustment



Higher gain

Optimum gain

Lower gain

7. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	<p>See Figure 7. [Settings] CH1 CH2 50 mV/division 50 mV/division X-Y mode</p>	<ul style="list-style-type: none"> ● Player state Test mode, play ● Adjustment location VR151 (TRK. GAN) ● Disc YEDS-7 	

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL SEARCH FWD ▶ or REV ◀ key to move the pickup to halfway across the disc ($R=35\text{ mm}$), then press the PROGRAM key, the PLAY ▶ key, then the PAUSE III key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

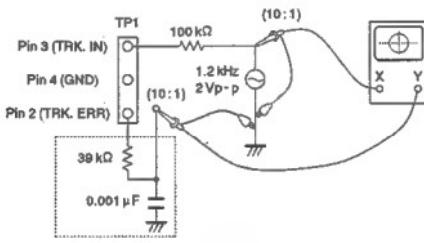
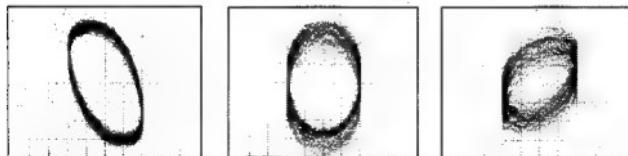


Figure 7

Tracking Gain Adjustment



8. Focus Error Signal (Focus S Curve) Verification

● Objective	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal.		
● Symptom when out of adjustment			
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 6 (FCS. ERR). [Settings] 100 mV/division 5 ms/division. DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TPI Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

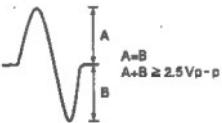


Figure 8

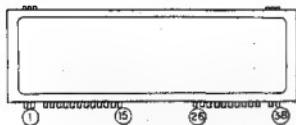
[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VRI (laser power) is adjusted, the RF signal can not be brought up to the standard level.

7. FL INFORMATION

EXTERNAL VIEWS



DISPLAY PATTERN ANODE GRID ASSIGNMENT



ANODE GRID ASSIGNMENT AND PIN ASSIGNMENT

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
a	a	a	a	a	a	a	a	/	►	a
b	b	b	b	b	b	b	b	SCAN	■	b
c	c	c	c	c	c	c	c	►OPEN	54	c
d	d	d	d	d	d	d	d	reserving	46	d
e	e	e	e	e	e	e	e	►(single)	60	e
f	f	f	f	f	f	f	f	►(scan)	90	f
g	g	g	g	g	g	g	g	SINGLE	74	g
h	/	DISPLAY	OFF	FADER	1 ►	REPEAT	AUTO SPACE	► OFF	TIME FADE	/
i	1	2	4	5	7	8	10	►(ALL)	AUTO	/
j	TRACK	STEP	6	/	/	B	PGM	ALL	EDIT	/
k	/	12	INDEX	15	MIN	18	►	►(RND)	PEAK SEARCH	SEC
l	11	13	14	16	17	19	DEL	RND	COMPU	/



PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Assignment	F	F	NP	e	f	g	■	a	b	c	d	i	j
Pin No.	14	15	16	17	18	19	20	21	22	23	24	25	26
Assignment	k	l	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	GJ
Pin No.	27	28	29	30	31	32	33	34	35	36	37	38	
Assignment	G2	G3	G4	G5	G6	G7	G8	G9	G10	NP	F	F	

F : Filament

G1-G10 : Grid

a-l : Anode

NP : No pin

8. FOR PD-8700/HEM, HB, SD AND PD-8700-S/HEWM TYPES

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by “◎” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

CONTRAST OF MISCELLANEOUS PARTS

The PD-8700/HEM, HB, SD and PD-8700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
△◎	Mother board assembly	PWM1448	PWM1449	PWM1449	PWM1449	PWM1449	*1
△	S trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
△	A trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
△	AC power cord	PDG1015	PDG1003	PDG1036	PDG1013	PDG1003	
△	Power transformer S(AC120V)	PTT1179					
△	Power transformer S(AC220,240V)		PTT1178	PTT1178		PTT1178	
△	Power transformer S (AC110,120-127, 220, 240V)				PTT1181		
△	Power transformer A(AC120V)	PTT1183					
△	Power transformer A(AC220,240V)		PTT1182	PTT1182		PTT1182	
△	Power transformer A (AC110,120-127, 220, 240V)				PTT1185		
△	Voltage selector						
△	Strain relief	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	
△	Cord with plug (mini plug)	PDE-319					
	Front panel assembly	PEA1164	PEA1132	PEA1132	PEA1132	PEA1152	
	Control panel	PNW1948	PNW1948	PNW1948	PNW1948	PNW2009	
	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1590	
	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1591	
	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1592	
	Search button	PAC1572	PAC1572	PAC1572	PAC1572	PAC1593	
	Headphone knob S					PAC1597	
	Knob C	RAC1608	RAC1608	RAC1608	RAC1608		
	Slide knob	RAC1428	RAC1428	RAC1428	RAC1428	PAC1599	
	Tray panel	PNW2025	PNW1949	PNW1949	PNW1949	PNW2011	
	Display window	PAM1503	PAM1488	PAM1488	PAM1503	PAM1488	
	Bonnet	PYY1148	PYY1148	PYY1148	PYY1148	PYY1154	
	CD packing case	PHG1679	PHG1678	PHG1678	PHG1678	PHG1680	For packing

*1 : As to the parts list of the Mother board assembly, refer to page 12.

*2 : These assemblies are the same as the PD-31/KU type for the service supply parts.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
	Operating instructions(English)	PRB1151			PRB1139	PRB1139	
	Operating instructions (English/French)		PRE1142				
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)			PRF1042			PRF1042
	Operating instructions (Spanish)				PRC1035		

9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND PD-7700-S/HEWM TYPES

9.1 CONTRAST OF MISCELLANEOUS PARTS

- NOTES:
- Parts without part number cannot be supplied.
 - Parts marked by “●” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
 - The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

The PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.								Remarks
		PD-31/KU /KU	PD-7700 /KC	PD-7700 /HEM	PD-7700 /HB	PD-7700 /SD	PD-7700 /HPW	PD-7700-S /HEWM		
▲ ●	Mother board assembly	PWN1446	PWM1444	PWM1444	PWM1445	PWM1445	PWM1447	PWM1444	PWM1445	
▲ ●	Audio board assembly	PWN2118	.....	.....	.....	.....	.....	.....	.....
▲ ●	S trans board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....
▲ ●	A trans board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....
▲ ●	Oversize board assembly	PWN2212	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	
▲ ●	SW board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲ ●	Headphone board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲ ●	Jack board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....
▲	Voltage selector	.....	.....	.....	.....	PSB1002	.....	.....	.....
▲	Power transformer S(AC120V)	PTT1179	PTT1179	PTT1179	PTT1178	PTT1178	PTT1178	PTT1178	PTT1178	
▲	Power transformer S(AC220 240V)	.....	.....	.....	.....	PTT1181	.....	.....	.....
▲	Power transformer S(AC110, 120-127, 220, 240V)	.....	.....	.....	.....	PTT1181	.....	.....	.....
▲	Power transformer A(AC120V)	PTT1183	.....	.....	.....	.....	.....	.....	.....
▲	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1033	PDG1006	PDG1003	PDG1003	
▲	Scrin retainer	CM-22C	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	CM-22B	
▲	Front panel assembly	PEA1164	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	
▲	Control panel	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW2009	
	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1590	
	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1591	
	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1592	
	Search button	PAC1572	.....	.....	.....	.....	.....	.....	.....
	Headphone knob	.....	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1601	
	Slide knob	RAC1428	.....	.....	.....	.....	.....	.....	.....
	Knob C	RAC1608	.....	.....	.....	.....	.....	.....	.....
	Display window	PAM1503	PAM1503	PAM1503	PAM1488	PAM1488	PAM1503	PAM1503	PAM1488	
	Cord with plug (mini plug)	PDE-319	.....	.....	.....	.....	.....	.....	.....
	Tray panel	PNW2005	PNW1049	PNW1049	PNW1049	PNW1049	PNW1049	PNW1049	PNW2011	
	Bonnet	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1154	
	CD packing case	PHG1679	PHG1683	PHG1683	PHG1681	PHG1681	PHG1681	PHG1681	PHG1682	
	Stopper	PNM1134	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	
	Insulator	PNW2020	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	
	Cord clammer	RNH-184	.....	.....	.....	.....	.....	.....	.....
	BIA/S lens	RNH1674	.....	.....	.....	.....	.....	.....	.....
	Operating instructions(English)	PRB1151	PRB1139	PRE1142	PRE1142	PRB1139	PRB1139	PRB1139	.....
	Operating instructions(English/French)	.....	.....	.....	.....	.....	.....	.....	.....
	Operating instructions(German/Italian/Dutch/Swedish/Spanish/Portuguese)	.....	.....	.....	.....	.....	.....	.....	PRF1042	
	Operating instructions(Spanish)	.....	.....	.....	.....	PRC1035	.....	.....	.....

For Packing

9.2 P.C.B.'s PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10¹ 561 RD1/4PS[5][6][J]

47kΩ 47 × 10³ 473 RD1/4PS[4][7][S]

0.5Ω 0R5 RD2H[0][R][5]K

1Ω 010 RD1P[0][1]0K

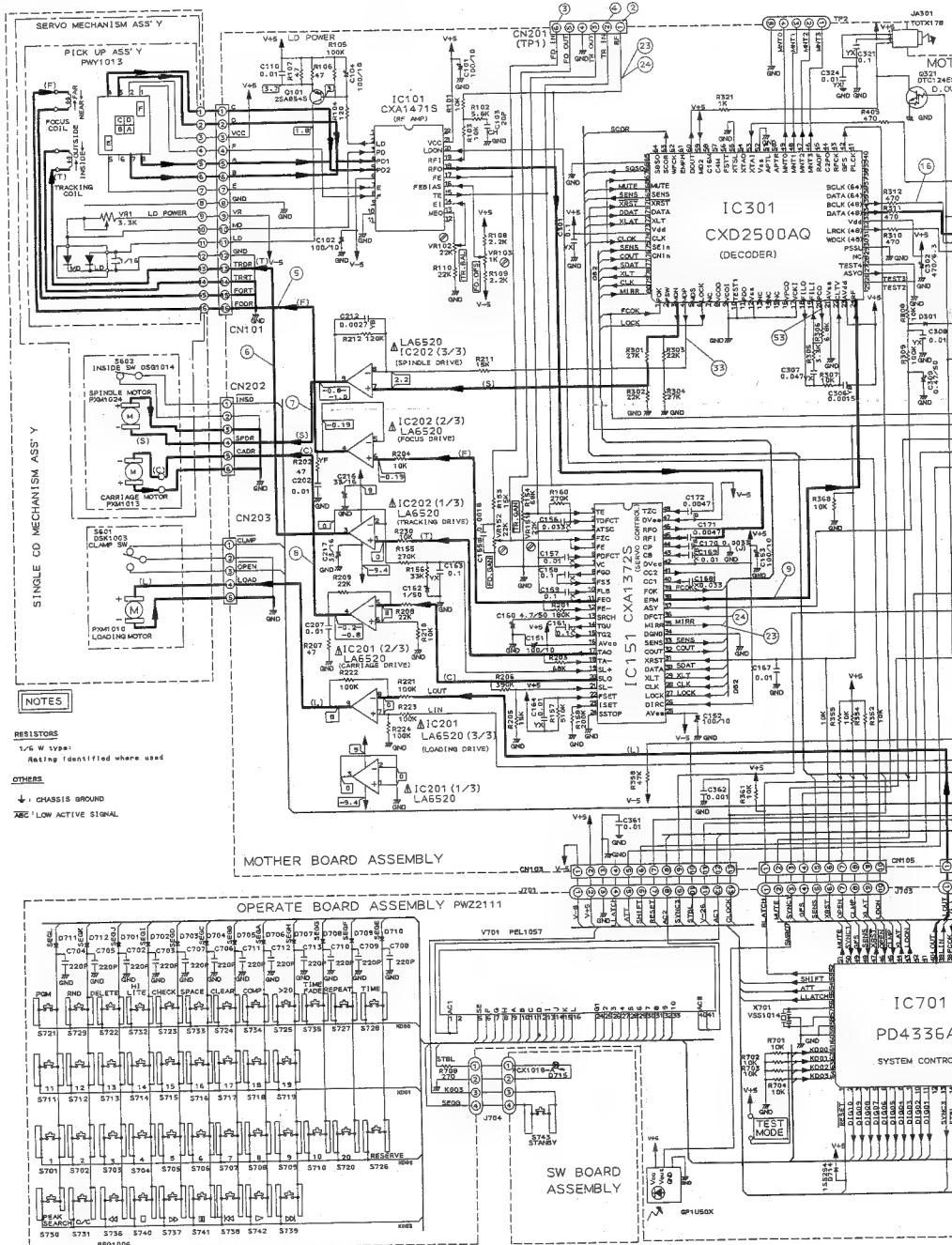
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10³ 5621 RD1/4SR[5][6][2][F]

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.	
① MOTHER BOARD ASSEMBLY						
(PWM144: PD-7700/KU, KC and HPW types)			L393	AXIAL INDUCTOR	LAU010K	
(PWM1445: PD-7700/HEM, HB and			L394	AXIAL INDUCTOR	LAU010K	
PD-7700-S/HEWM types)			CAPACITORS			
(PWM1447: PD-7700/SD type)			C11, C13	CERAMIC CAPACITOR	CKCYF108Z50	
SEMICONDUCTORS			C15, C16	CERAMIC CAPACITOR	CKCYF108Z60	
▲ IC20 REGULATOR IC	M5298P		C25	ELECTROLYTIC CAPACIT	CEAS472M18	
IC21 REGULATOR IC	NJM78L06A		C26	ELECTR.CAPACITOR	CEAS222M16	
IC22 REGULATOR IC	NJM78L06A		C27	ELECTROLYTIC CAPACITT	CEAS471M6R8	
IC23 REGULATOR IC	NJM7805FA		C28	ELECTR.CAPACITOR	CEAS101M10	
▲ IC31 IC(PWM1445, PWM1447 only)	ICP-N10		C52	ELECTR.CAPACITOR	CEAS101M85	
IC101 PRE AMP IC	CXA1471S		C60	ELECTR.CAPACITOR	CEAS101M50	
IC151 SERVO IC	CXA1372S		C61, C62	ELECTR.CAPACITOR	CEAS101M16	
▲ IC201,IC202 POWER OP-AMP,IC	LA6520		C63	ELECTR.CAPACITOR	CEAS102N16	
IC301 EFM DEMODULATION IC	CXD2500AQ		C101, C102	ELECTR.CAPACITOR	CEAS101M10	
IC401 D/A CONVERTER,IC	PD2026A		C103	CERAMIC CAPACITOR	CCCHC200J50	
IC402 OP-AMP IC	M5238PP		C104	ELECTR.CAPACITOR	CEAS101M10	
(PWM1444, PWM1447 only)			C110	CERAMIC CAPACITOR	CKCYF108Z60	
IC402 OP-AMP IC	NJM5532DD		C151-C153	ELECTR.CAPACITOR	CEAS101M10	
(PWM1445 only)			C155	CERAMIC CAPACITOR	CKCYB152K50	
Q101 TRANSISTOR	2SA854S		C156	CERAMIC CAPACITOR	CGCYX333K25	
Q321,Q351 TRANSISTOR	DTC124ES		C157	CERAMIC CAPACITOR	CGCYX103K25	
Q391 TRANSISTOR	2SC1740S		C158, C189	CERAMIC CAPACITOR	CGCYX104K25	
Q401-Q404 TRANSISTOR	2SD2144S		C160	ELECTR.CAPACITOR	CEAS4R7M80	
Q405 TRANSISTOR	DTC124ES		C161	CERAMIC CAPACITOR	CGCYX104K25	
Q406 TRANSISTOR	DTA124ES		C162	ELECTR.CAPACITOR	CEAS101M50	
Q451, Q452 TRANSISTOR	DTA124ES		C163	CERAMIC CAPACITOR	CGCYX104K25	
Q453, Q454 TRANSISTOR	2SB1296		C164	CERAMIC CAPACITOR	CGCYX103K25	
▲ D11-D14,D52 DIODE	11ES2		C167	CERAMIC CAPACITOR	CKCYF108Z50	
D54 ZENNER DIODE	MTZJ18B		C168	CERAMIC CAPACITOR	CGCYX333K25	
D301 DIODE	ISS254		C169	CERAMIC CAPACITOR	CGCYX103K25	
D391-D394 DIODE(PWM1444 only)	ISS254		C170	CERAMIC CAPACITOR	CKCYB332K50	
D395-D397 DIODE	ISS254		C171, C172	CERAMIC CAPACITOR	CKCYB472K50	
D451,D452 DIODE	ISS254		C202, C207	CERAMIC CAPACITOR	CKCYF108Z50	

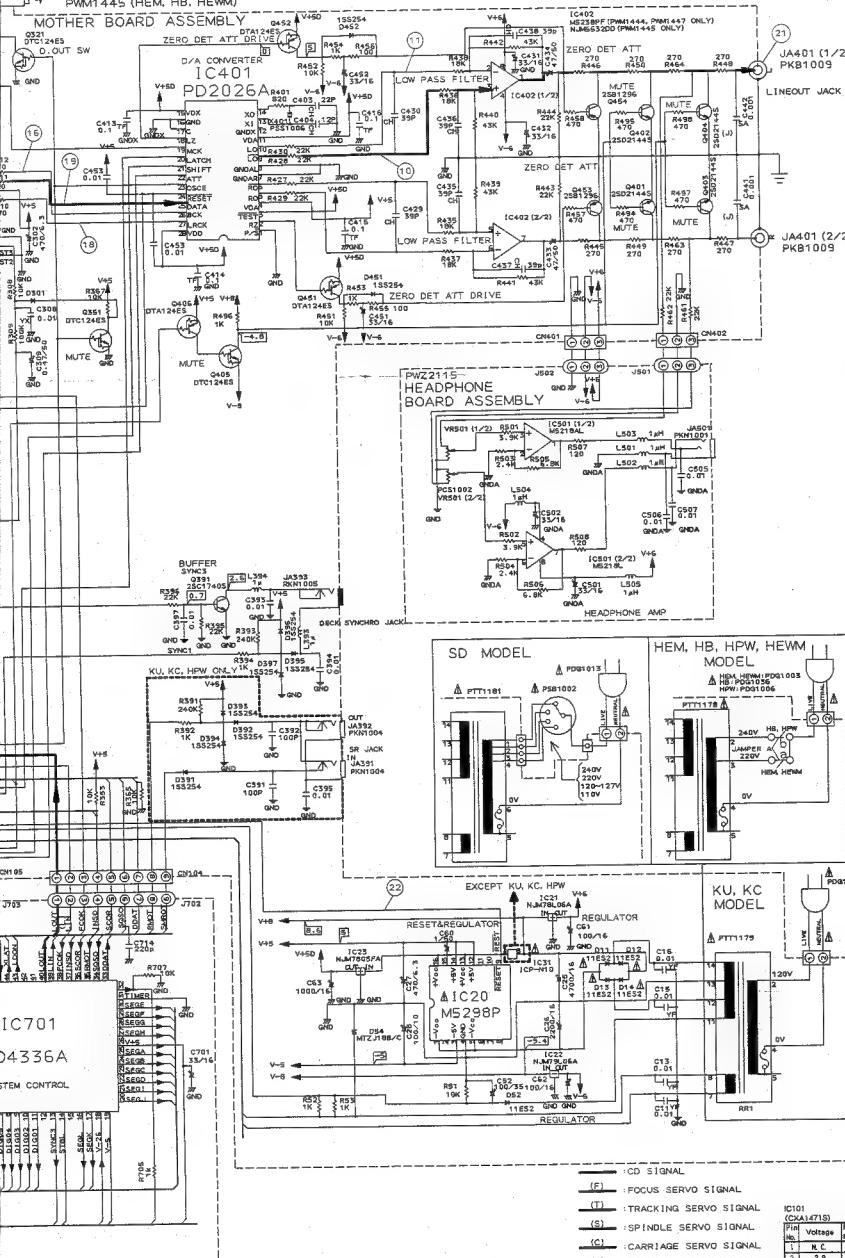
Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
C212		CERAMIC CAPACITOR	CKCYB272K50				
C216,C217		ELECTR.CAPACITOR	CEAS330M16				
C301		CERAMIC CAPACITOR	CGCYX104K25				
C302		ELECTROLYTIC CAPACIT	CRAS471M6R3				
C306		CERAMIC CAPACITOR	CKCYB152K50				
C307		CERAMIC CAPACITOR	CGCYX473K25				
C308		CERAMIC CAPACITOR	CGCYX103K25				
C309		ELECTR.CAPACITOR	CEASR47M50				
C321		CERAMIC CAPACITOR	CGCYX104K25				
C324		CERAMIC CAPACITOR	CKCYF103Z50				
C361		CERAMIC CAPACITOR	CKCYF103Z50				
C362		CERAMIC CAPACITOR	CKCYB102K50				
C391,C392		CERAMIC CAPACITOR (PWM1444 only)	CCCSL101J50				
C393,C394		CERAMIC CAPACITOR	CKCYF103Z50				
C395		CERAMIC CAPACITOR (PWM1444 only)	CKCYF103Z50				
C397		CERAMIC CAPACITOR	CKCYF103Z50				
C403		CERAMIC CAPACITOR	CCCOCH220J50				
C404		CERAMIC CAPACITOR	CCCOCH120J50				
C413-C416		AUDIO FILM CAPACITOR	CFTXA104J50				
C429,C430		CERAMIC CAPACITOR	CCCOCH380J50				
C451,C452		ELECTR.CAPACITOR	CEAS330M16				
C453		CERAMIC CAPACITOR	CKCYF103Z50				
RESISTORS							
VR102	VR		VRTB6VS223				
VR103	VR		VRTB6VS102				
VR151	VR		VRTB6VS223				
VR152	VR		VRTB6VS223				
R301		CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM244J				
R302		CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM102J				
Other resistors			RD1/6PM□□□				
OTHERS							
CN101		CONNECTOR	52045-1610				
JA301		OPTICAL OUTPUT JACK	TOTX178				
JA391		JACK/12V(PWM1444 only)	PKN1004				
JA392		JACK/12V(PWM1444 only)	PKN1004				
JA393		JACK (min)	PKN1006				
JA401		JACK (2P)	PKB1009				
X401		XTAL RES (OSC)	PSS1006				
OPERATE BOARD ASSEMBLY (PWZ2111)							
SEMICONDUCTORS							
IC701		MICROCOMPUTER,IC	PD4336A				
D701-D714		DIODE	ISS254				
SWITCHES							
S701-S742		SWITCH	PSG1006				
1-20		PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, O/L, HI LITE SCAN, AUTO SPACE, COMPU, TIME FADE, <1, □, ▲, △, ▽, STOP(□), PLAY(>)					
CAPACITORS							
C701		ELECTR.CAPACITOR	CEAS330M16				
C702-C714		AXIAL CAPACITOR	CKPUYB221K50				
RESISTORS							
All resistors			RD1/6PM□□□				
OTHERS							
V701		FL INDICATOR TUBE	PEL1057				
X701		CERAMIC RESONATOR, PHOTO SENSOR UNIT	VSS1014				
			GP1U60X				
SW BOARD ASSEMBLY							
SEMICONDUCTORS							
D715		LED	PCX1018				
SWITCHES							
S743		SWITCH (ON/STN BY)	PSG1006				
HEADPHONE BOARD ASSEMBLY							
SEMICONDUCTORS							
IC501		OP-AMP,IC	M5218AL				
COILS							
L501-L505		AXIAL INDUCTOR	LAU010K				
CAPACITORS							
C501,C502		ELECTR.CAPACITOR	CEAS330M16				
C505-C507		CERAMIC CAPACITOR	CGCYF103Z50				
RESISTORS							
VR501		VARIABLE RESISTOR	PCS1002				
Other resistors			RD1/6PM□□□				
OTHERS							
JA501		JACK	RKN1001				

9.4 SCHEMATIC DIAGRAM



JAS01-
TOTX178- PWM1444 (KU, KC, HPW)
PWM1447 (SD)

PWM1445 (HEM, HB, HEWM)
NOTER BOARD ASSEMBLY

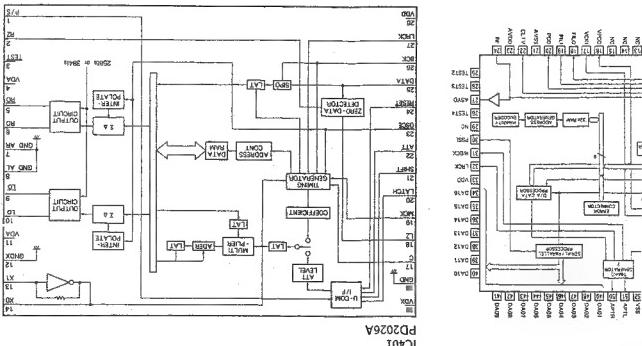
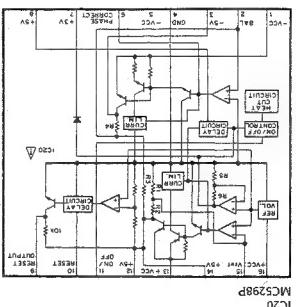


Pkt	No.	Pkt No.	Pin No.	Voltage
1	0	25	-	5
2	0	26	-	5
3	0	27	-	5
4	1	31	-	5
5	0	29	-	5
6	0	30	-	3
7	0	31	5	5
8	0	32	0	0
9	0	33	5	5
10	0	34	0	0
11	1	35	-	5
12	0	36	5	5
13	0	37	5	2.5
14	0	38	-	2.5
15	0	39	5	5
16	5	40	-	1
17	0	41	-	1.7
18	0	42	-	1
19	0	43	-	0.7
20	0,1,2,4,8	44	-	0
21	0	45	-	0
22	1,2,3,4,5,6,7,8	46	-	0
23	1,2	47	-	0
24	1,2	48	-	0

IC#	Description	Pin		Voltage
		Ref	Alt	
1	N.C.	1	R.C.	
2	N.C.	2	R.C.	
3	S	3	R.C.	
4	2.6	4	R.C.	
5	R.C.	5	R.C.	
6	N.C.	6	R.C.	
7	N.C.	7	R.C.	
8	N.C.	8	R.C.	
9	0	9	1.2	
10	N.C.	10	5.0	
11	R.C.	11	R.C.	
12	N.C.	12	R.C.	
13	R.C.	13	5.0	
14	R.C.	14	5.0	
15	N.C.	15	R.C.	
16	N.C.	16	5.0	
17	N.C.	17	5.0	
18	5.0	18	R.C.	
19	2.4	19	5	
20	N.C.	20	R.C.	
21	0	21	6.1	
22	2.5	22	6.1	
23	0	23	6.3	
24	2.5	24	6.3	
25	0	25	6.3	
26	0	26	3.3-5	
27	2.5	27	5	
28	R.C.	28	8.0	
29	N.C.	29	2.1-5	
30	N.C.	30	7.0	
31	1.3-2.2	31	7.1	
32	2.5	32	7.5	
33	5	33	7.5	
34	2.5	34	7.5	
35	5	35	7.5	
36	N.C.	36	10	
37	N.C.	37	11	
38	R.C.	38	11	
39	R.C.	39	11	

PN	PN NAME	Filter	Wavelength (Å)	Phase (d)	Phase Width (d)	Phase Mean
1	1	V	550	-1.5	1.5	0
2	-24 + 31.3	V	550	1.5	1.5	30
3	-24 + 31.3	V	550	3.5	1.5	30
4	-24 + 31.3	V	550	6	1.5	30
5	-24 + 31.3	V	550	31	1.5	30
6	-24 + 31.3	V	550	36	5	30
7	-24 + 31.3	V	550	37	5	30
8	-24 + 31.3	V	550	38	5	30
9	-24 + 31.3	V	550	39	5	30
10	-24 + 31.3	V	550	40	5	30
11	-24 + 31.3	V	550	43	5	30
12	-24 + 31.3	V	550	6	5	30
13	-24 + 31.3	V	550	5.5	5	30
14	-24 + 31.3	V	550	45	5	30
15	-24 + 31.3	V	550	45	5	30
16	-24 + 31.3	V	550	45	5	30
17	-24 + 31.3	V	550	46	5	30
18	-24 + 31.3	V	550	46	5	30
19	-24 + 31.3	V	550	47	5	30
20	-24 + 31.3	V	550	47.5	5	30
21	-24 + 31.3	V	550	50	5	30
22	-24 + 31.3	V	550	50	5	30
23	-24 + 31.3	V	550	50	5	30
24	-24 + 31.3	V	550	50	5	30
25	-24 + 31.3	V	550	50	5	30
26	-24 + 31.3	V	550	50	5	30
27	-24 + 31.3	V	550	50	5	30
28	-24 + 31.3	V	550	50	5	30
29	-24 + 31.3	V	550	50	5	30
30	-24 + 31.3	V	550	50	5	30
31	0	V	550	63	5	30

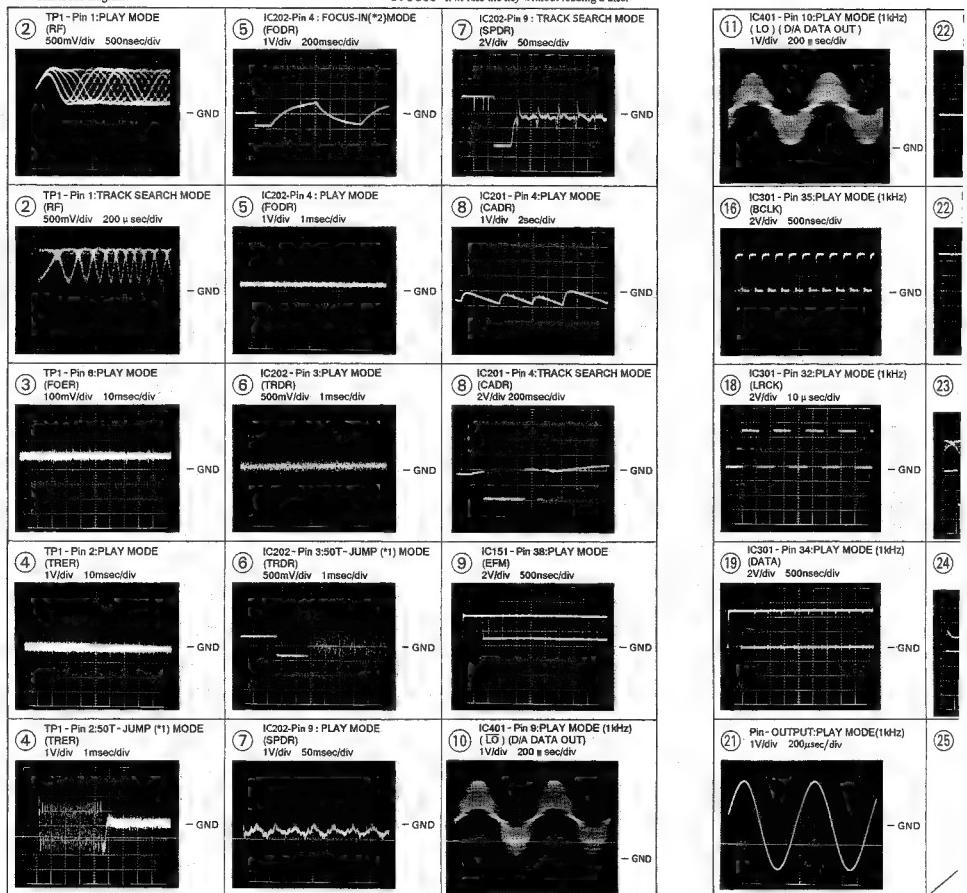
Pin No.	Voltage	Pin No.	Vol
1	0	15	
2	0	16	
3	5	17	N.
4	5	18	
5	2.4	19	
6	2.6	20	
7	0	21	
8	0	22	
9	2.5	23	
10	2.4	24	
11	5	25	
12	0	26	
13	2.4	27	

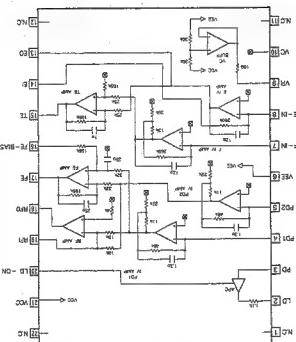
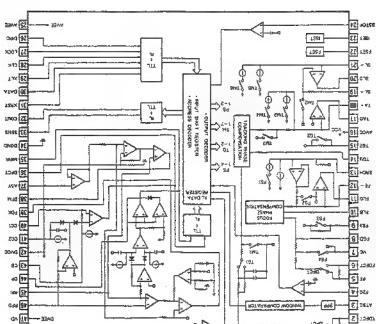
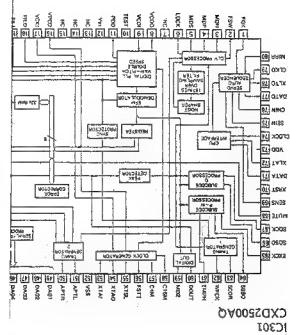


9.3 WAVEFORMS

Note: The encircled numbers denote measuring in the schematic diagram.

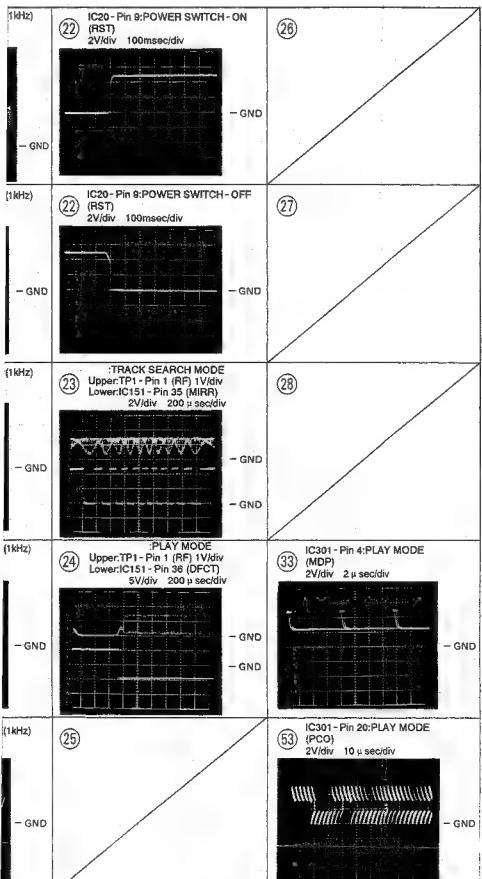
*1 5OT - JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.





i201 CXA171S

• IC BLOCK DIAGRAM



1. RESISTORS :

Indicated in Ω , 1/4W, 1/W and 1/W, $\pm 5\%$ tolerance unless otherwise noted.
k : kΩ M : MΩ (F) : $\pm 1\%$ (G) : $\pm 2\%$ (K) : $\pm 10\%$ (M) : $\pm 20\%$ tolerance.

2. CAPACITORS :

Indicated in capacity (μF) / voltage (V) unless otherwise noted p : pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :

\square : DC voltage (V) at play state.
 I_{max} : DC current at play state.
Value in $(\)$ is DC current at stop state.

4. OTHERS :

\leftrightarrow : Signal route.
 \odot : Adjusting point.
The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
* marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underline indicates the switch position)

SWITCH BOARD ASSEMBLY

S741 : POWER ON/OFF

OPERATE BOARD ASSEMBLY

S701 : 1	S733 : CHECK
S742 : 2	S724 : CLEAR
S703 : 3	S725 : > 20
S704 : 4	S726 : RESERVE
S705 : 5	S727 : REPEAT
S706 : 6	S728 : TIME
S707 : 7	S729 : RND
S708 : 8	S730 : PEAK SEARCH
S709 : 9	S731 : O/L
S710 : 10	S732 : HI LITE SCAN
S711 : 11	S733 : AUTO SPACE
S712 : 12	S740 : CPU
S713 : 13	S735 : TIME FADE [EDIT]
S714 : 14	S736 : < 1] MANUAL SEARCH
S715 : 15	S737 : > 1]
S716 : 16	S738 : < 1] TRACK SEARCH
S717 : 17	S739 : > 1]
S718 : 18	S740 : STOP []
S719 : 19	S741 : PAUSE []
S720 : 20	S742 : PLAY []
S721 : PGM	S743 : ON/STN BY
S722 : DELETE	S744 : STANDBY

Line Voltage Selection (For HB, HEM, HPW and HEWM types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

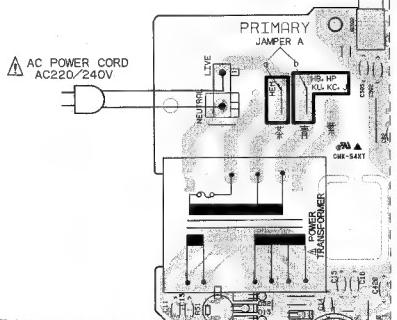
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

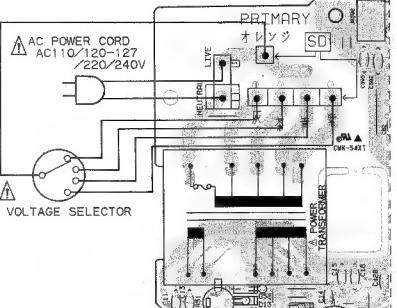
9.5 P.C.BORDS CONNECTION DIAGRAM

A

POWER SUPPLY SECTION FOR HEM,HB,HPW AND HEWM TYPES

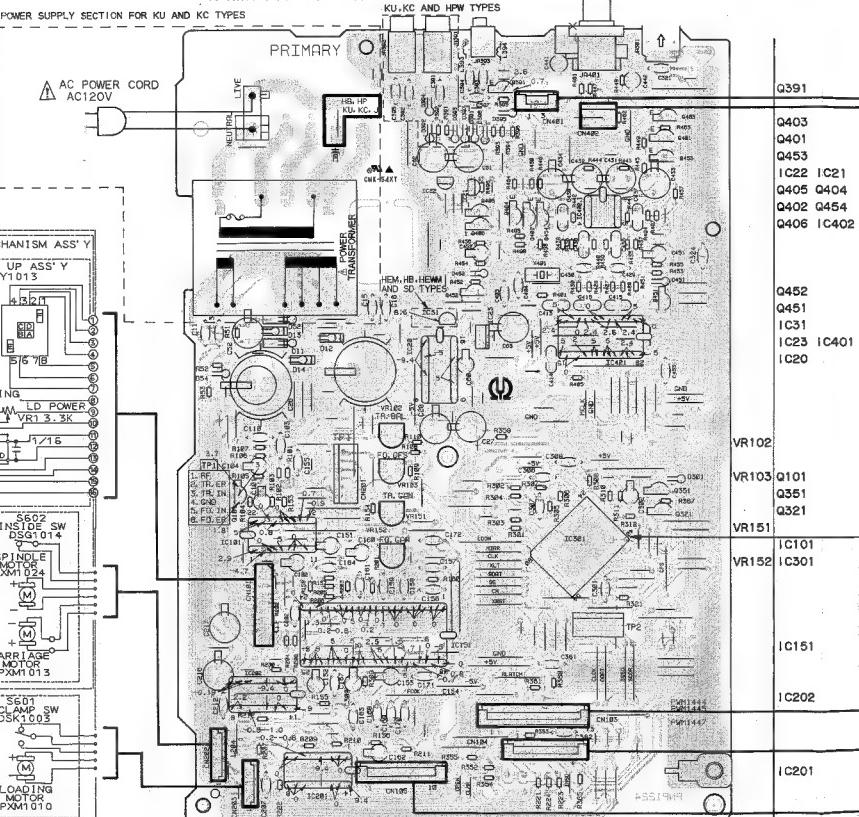


C POWER SUPPLY SECTION FOR SD TYPE



3

MOTHER BOARD ASSEMBLY
(PWM1444:KU,KC AND HPW TYPES)
(PWM1445:HEM,HB AND HEWM TYPES)
(PWM1447:SD TYPE)



1

2

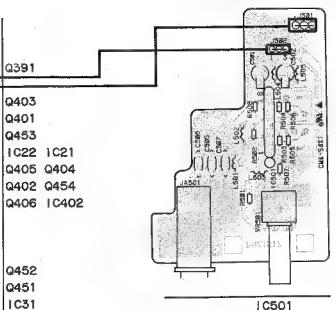
3

4

5

6

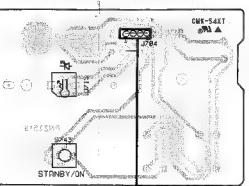
HEADPHONE BOARD ASSEMBLY



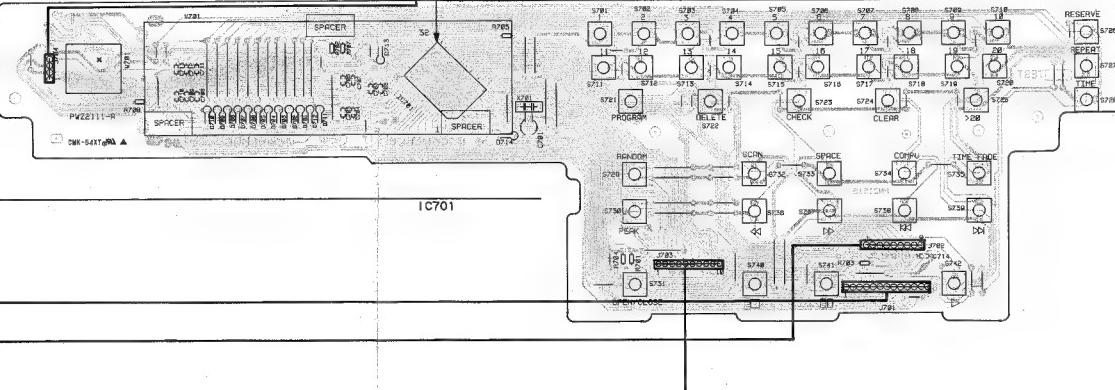
IC151
IC202
IC201

ICSM (D2020H)		Voltage	
1	S	4.5	N.C.
2	K.C.	4.5	S
3	S	4.5	K.C.
4	2.6	4.4	K.C.
5	4.5	4.4	K.C.
6	S	4.4	K.C.
7	K.C.	4.1	0
8	K.C.	4.1	0
9	0	4.9	0 - 0.3
10	0	0.9	K.C.
11	K.C.	1.0	K.C.
12	0	1.5	S
13	K.C.	2.5	S
14	K.C.	5.4	K.C.
15	0	5.4	0
16	K.C.	5.0	K.C.
17	0	5.7	K.C.
18	2.5	5.8	K.C.
19	2.5	5.8	K.C.
20	5.4	5.8	0
21	0	6.1	K.C.
22	1.5	6.1	K.C.
23	5	6.1	K.C.
24	2.5	6.4	K.C.
25	K.C.	6.5	D
26	0	3.3 - 5.5	S
27	2.5	4.7	1.5
28	0	4.8	0
29	0	2.1	0
30	0	7.0	5
31	1.3 - 2.2	7.1	5
32	0.5	7.2	5
33	0	7.5	5
34	2.5	7.4	5
35	K.C.	15	5
36	0	9	0
37	K.C.	11	5
38	K.C.	16	5
39	K.C.	19	5
40	K.C.	20	0

SW BOARD ASSEMBLY



OPERATE BOARD ASSEMBLY (PWZ2111)



P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			FET
		Diode			Zener diode
		LED			Varactor
		Tact switch			Inductor
		Transformer			Filter
					Resistor array
					Resistor
					Reactor
					Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.

2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above table.

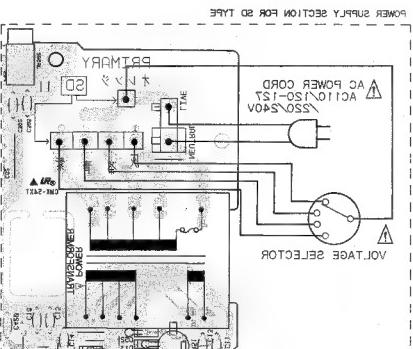
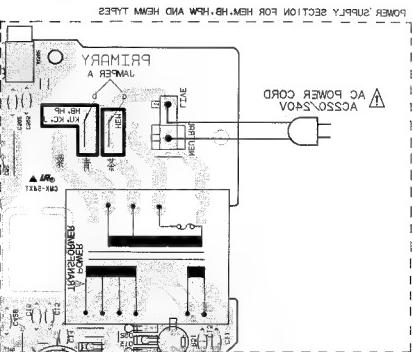
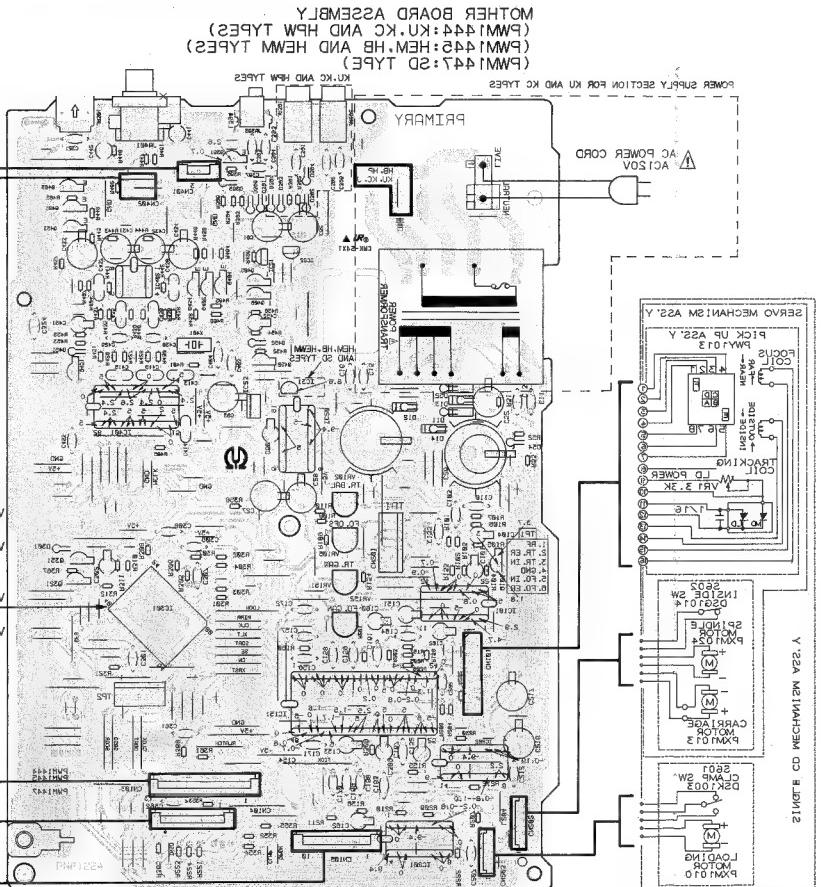
3. The terminal marked with shows negative terminal.

4. The diode marked with shows cathode side.

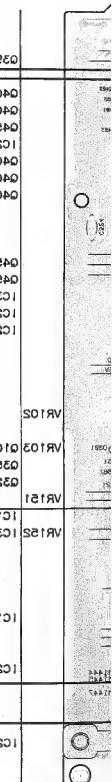
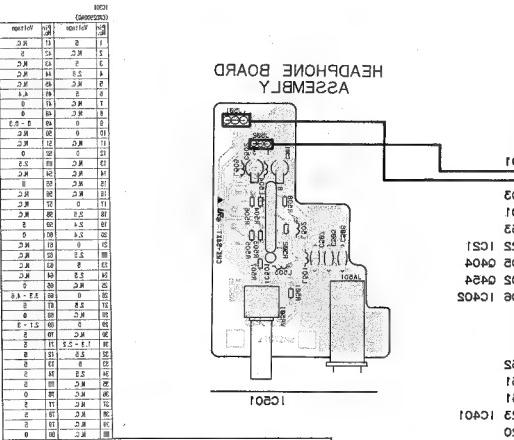
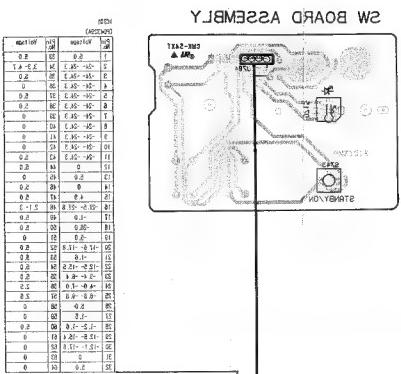
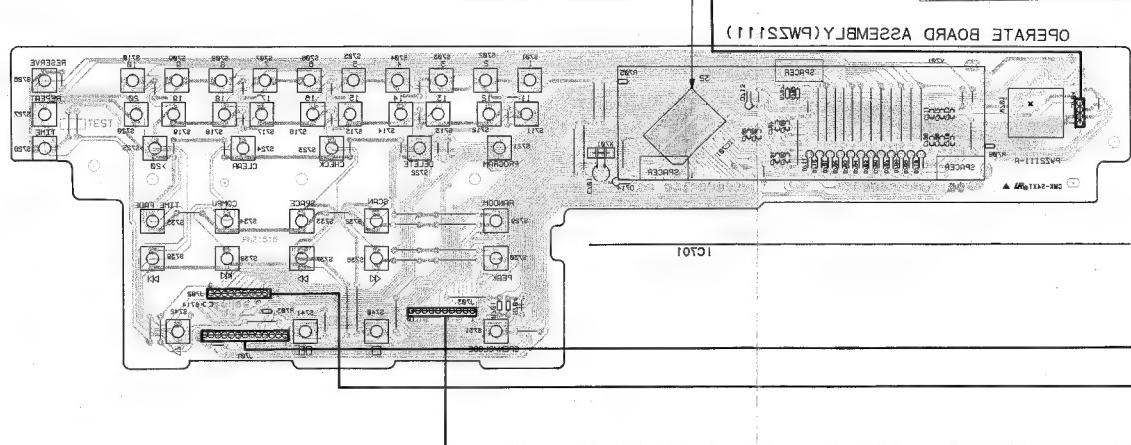
5. The diode marked with shows anode side.

6. The capacitor marked with shows series side.

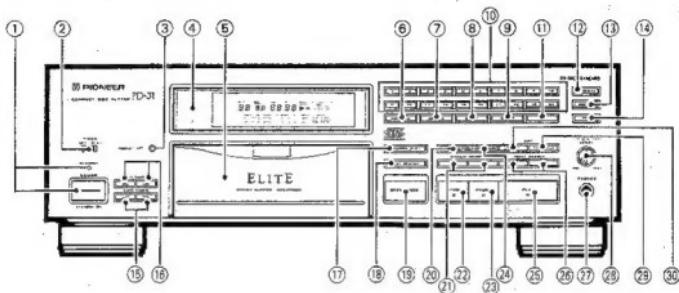
7. The capacitor marked with shows shunt side.



This P.C.B. connection diagram is viewed from the foil side.



10. PANEL FACILITIES



FRONT PANEL

① POWER STANDBY/ON switch and indicator

Press this switch to turn the power on. The unit will set to the standby mode and the STANDBY indicator will light.

② TIMER OFF/PLAY switch

③ DISPLAY OFF button

④ Remote sensor

⑤ Disc tray

⑥ PROGRAM button

⑦ DELETE button

⑧ CHECK button

⑨ CLEAR button

⑩ Track number buttons (1–20)

⑪ > 20 button

⑫ REVERSE button

⑬ REPEAT button

⑭ TIME button

⑮ AUTO FADER buttons (~, ~)

⑯ INDEX SEARCH buttons (~, ~)

⑰ RANDOM PLAY button

⑱ PEAK SEARCH button

⑲ OPEN/CLOSE button

⑳ HI-LITE SCAN button

㉑ MANUAL SEARCH buttons (◀◀, ▶▶)

㉒ STOP button (■)

㉓ PAUSE button (■■)

㉔ AUTO SPACE button

㉕ PLAY button (▶)

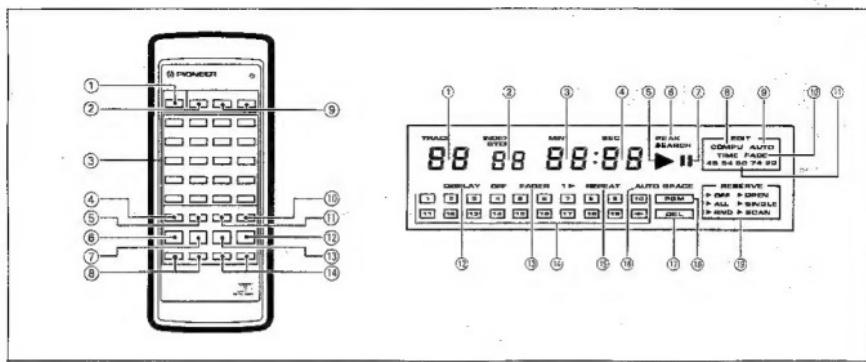
㉖ TRACK SEARCH buttons (◀◀, ▶▶)

㉗ Headphones jack (PHONES)

㉘ Headphones/line volume control (PHONES/LINE LEVEL)

㉙ TIME FADE EDIT button

㉚ Program edit button (EDIT) (■ COMPU/■■ AUTO)



REMOTE CONTROL UNIT

Buttons listed here but not accompanied with explanations have the same functions as the corresponding front panel buttons.

- ① POWER button
- ② OPEN/CLOSE button
- ③ Track number buttons (1–20)
- ④ HI-LITE SCAN button
- ⑤ RESERVE button
- ⑥ RANDOM PLAY button
- ⑦ STOP button (■)
- ⑧ Manual search buttons (MANUAL <◀, ▶▶)
- ⑨ OUTPUT LEVEL buttons (–, +)
- ⑩ > 20 button
- ⑪ PROGRAM button
- ⑫ PLAY button (▶)
- ⑬ PAUSE button (■■)
- ⑭ Track search buttons (TRACK <◀, ▶▶)

DISPLAY

- ① Displays track numbers (01–99) during playback or track search.
- ② Displays index numbers (sub-divisions of tracks); during program input, indicates program steps.
- ③ Displays track playing time and remaining time (minutes).
- ④ Displays track playing time and remaining time (seconds).
- ⑤ Lights during playback.
- ⑥ Lights when peak volume levels on the disc are detected.
- ⑦ Lights during playback pause.
- ⑧ Lights during use of computer allocated program editing or auto program editing.
- ⑨ Lights during auto program editing.
- ⑩ Lights during time fade editing.
- ⑪ Indicates the editing time.
- ⑫ Lights when display is in OFF mode.
- ⑬ Lights during operation of fade function.
- ⑭ Calendar display. Lighted numbers indicate total number of tracks on the disc (during program input and program playback, indicates programmed tracks). When a track completes playback, the corresponding lighted number goes out. Arrow mark [→] lights for tracks higher than "19".
- ⑮ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
- ⑯ Lights during auto space.
- ⑰ Lights during delete mode.
- ⑱ Lights during program mode.
- ⑲ When "reserve" function is activated, these indicators light in correspondence to the reserved functions (OFF, OPEN, ALL, SINGLE, RND, SCAN).

11. SPECIFICATIONS

1. General

Type	Compact disc digital audio system
Usable discs	Compact Disc
Power requirements	AC 120V, 60Hz
Power consumption	18W
Operating temperature	+5°C - +35°C (+41°F - +95°F)
Weight	5.0kg (11lb)
External dimensions	420(W) x 274(D) x 135(H)mm 16-9 / 16(W) x 10-13/16(D) x 5-5/16(H) in.

2. Audio section

Frequency response	2Hz - 20kHz ± 0.5dB
S/N	108dB or more (EIAJ)
Dynamic range	97dB or more (EIAJ)
Channel separation	102dB or more (EIAJ)
Total harmonic distortion	0.0022% or less (EIAJ)
Wow and flutter	Limit of measurement (± 0.001% W.PEAK) or less (EIAJ)
Number of channels	2 channels (stereo)

3. Output terminal

- Audio line output terminals (FIXED)
- Audio line output terminals (VARIABLE)
- CD-DECK SYNCHRO terminal
- Headphone jack (with motor drive volume control)
- Optical digital output terminal
- Control input/output terminals

4. Functions

- Play
- Pause
- Stop
- Auto space
- Manual search
- Track search
- Index search
- Peak search
- Hi-lite scan
- Direct selection

- Single track repeat
- All track repeat
- Programmed repeat
- Delete repeat
- Random play repeat
- Programmed random play repeat
- Delete play repeat random
- Programmed playback (up to 24 tracks)
- Delete playback
- Pause program
- Program check
- Program correction
- Program clear
- Auto program edit
- Compu program edit
- Time fade edit
- Digital level control
- Random play
- Programmed random play
- Delete random play
- Fade in/fade out
- Time location
- Reserve
- Display off
- Program hold
- Level hold
- Timer start
- CD-deck synchro

5. Accessories

● Remote control unit	1
● Size AAA/R03 dry cell batteries	2
● Output cable	1
● Control cord	1
● Operating instructions	1

NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

